

Overactive Bladder: Special Considerations in the Geriatric Population

Joseph G. Ouslander, MD; Ya-chen Tina Shih, PhD; James Malone-Lee, MD; and Karl Lubber, MD

Presentation Summary

Overactive bladder (OAB) is a highly prevalent condition among older patients, and its presence is associated with the use of substantial healthcare resources and economic costs. Within the next 30 years, it is expected that the demand for services related to OAB will increase dramatically. Treatment of OAB is challenging and depends on several factors, including the age of the patient, cognitive functioning, and the degree of mobility. Pharmacotherapy, such as the use of tolterodine and oxybutynin, is a viable option for the treatment of OAB, and muscarinic antagonists are commonly used. The efficacy of an agent may differ in older patients compared with younger ones. In addition, certain side effects can be particularly trouble-

some in the geriatric population. A retrospective analysis of a large managed care database showed an age-related increase in the number of women seeking care for OAB. Caring for incontinent patients in the long-term care setting was shown to result in substantial additional costs, which were higher in those with more frequent incontinent episodes.

Prompted voiding may be effective in reducing the number of incontinent episodes for those in institutionalized care; however, this practice is labor intensive and generally is only effective in 40% of cases. Moreover, assistance with prompted voiding must be maintained continuously. Future research should focus on defining the most cost-effective methods of treating OAB in the long-term care setting.

Overactive bladder (OAB), a condition characterized by urinary frequency, urgency, and urge incontinence occurring singly or in combination, is highly prevalent among the geriatric population. Urge incontinence has been the most common symptom studied, and its prevalence increases in a linear, statistically significant fashion with age. Studies have reported prevalence rates of 3% to 8% among women 20 to 29 years of age, increasing sharply after age 50 to

an estimated prevalence of more than 45% of women 50 to 59 years of age.^{1,2} Urinary incontinence also affects approximately 50% of the institutionalized geriatric population.^{3,4} In 1995, an estimated 6.3 million community-dwelling older adults and 1.2 million nursing home residents in the United States were living with a urinary incontinence condition.⁵ As far as OAB is concerned, these numbers are likely to be even higher.

Overactive bladder occurs when

the detrusor muscle of the bladder contracts prematurely during the filling phase of the micturition cycle. When this premature contraction is associated with inappropriate relaxation of the urethral sphincter, urine is voided uncontrollably. Although the exact etiology of OAB remains unknown in most cases, it occasionally occurs secondary to neurologic diseases, such as multiple sclerosis or Parkinson's disease, or it may occur after pelvic surgery in women. OAB may also develop in men with benign prostatic hyperplasia, because the detrusor muscle must contract more strongly and more frequently to compensate for the reduced urinary flow resulting from urethral obstruction. Risk factors for the development of urge incontinence include advanced age, diabetes, and urinary tract infections (UTIs).⁶

Studies have shown that OAB negatively affects the quality of life, regardless of the age of the person affected. Those with urge incontinence tend to reduce their social and personal activities as a result of their symptoms, with a resultant increase in psychological stress.⁷ Factors that affect quality of life among women with urge incontinence include increased frequency, nocturia, and pad usage.⁸ The extent to which OAB can affect the quality of life is greater than that observed in other disease states. For example, people with OAB have lower quality-of-life scores in social and functional domains than patients with diabetes.⁷ Among older women with urge incontinence, emotional problems, sleep disturbances, and social isolation are significantly greater than in age-matched controls who do not have incontinence.⁹ Although the adverse psychological impact of incontinence among nursing home residents is difficult to document, incontinent residents without severe dementia can often be frustrated and embarrassed.¹⁰

Many geriatric patients and their caregivers view OAB as an inevitable consequence of growing older. This is unfortunate, because many do not seek help and instead allow the disease to adversely affect their quality of life. Therapies have been shown to be effective in controlling symptoms in this patient population, but differences exist in the safety and tolerability of available pharmacotherapeutic agents, the efficacy of behavioral modifications and prompted voiding regimens, and costs associated with treatment in the geriatric population.

Response to Pharmacotherapy

The mainstay of pharmacotherapeutic treatment of OAB is a muscarinic antagonist such as oxybutynin or tolterodine. Tricyclic antidepressants, propantheline, and flvoxate have also been used.¹⁰ The anticholinergic properties of these agents may cause constipation, blurred vision, urinary retention, worsening of cognitive function, and dry mouth—adverse effects that are particularly troublesome to older patients.¹⁰ Several comparative studies have shown that dry mouth occurs much less frequently with tolterodine therapy than with oxybutynin therapy.^{11,12} Oxybutynin therapy has been associated with cognitive dysfunction in older patients.^{13,14} Tolterodine therapy may not be associated with impaired cognitive function in the geriatric population. Tolterodine is less lipophilic than oxybutynin, which may result in reduced penetration of the central nervous system and could explain its lower risk for cognitive dysfunction. However, further study of tolterodine in the geriatric population is warranted to better define the safety profile among this frail population, which is at high risk for developing cognitive dysfunction. In addition, the controlled-release formulation of oxybutynin requires further evaluation to determine if the side-effect

profile in the geriatric population differs from the immediate-release formulation.

Placebo-controlled clinical trials of tolterodine for the treatment of OAB have demonstrated that responses are more pronounced in older patients than in younger ones. After 4 weeks of therapy, significant improvements in both frequency and the number of urge incontinence episodes are seen in the geriatric patients receiving tolterodine therapy compared with placebo,¹⁵ but in younger patients, significant improvements are seen only in frequency. Significant reductions in the number of urge incontinence episodes were evident only in younger patients receiving tolterodine therapy after 8 weeks, and at the 8-week point all other responses in young and elderly patients were maintained, so the response to therapy in different age groups may vary with the length of treatment.

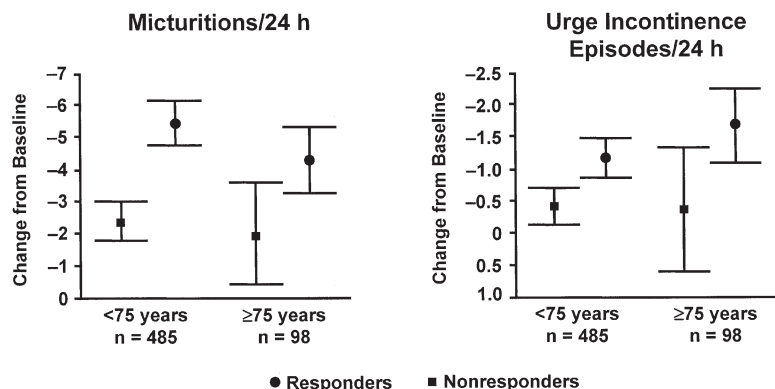
Differences in therapeutic efficacy in younger patients compared with older ones may be the result of the aging process, in which drugs may have altered pharmacokinetic properties because of age-related changes in absorption, volumes of distribution, and renal and hepatic clearance. In the case of OAB, older patients may have more severe disease than their younger counterparts, and pharmacotherapeutic responses and adverse effects may be greater. Moreover, conservative approaches to treatment, such as bladder training, may be ineffective in patients who have more severe disease.

A recent study evaluated the effects of pharmacotherapy and bladder training in 583 adult women with frequency, urgency, and urge incontinence (J. Malone-Lee, unpublished observation). Patients received therapy for 8 weeks, and data regarding daily micturitions and episodes of urge incontinence were recorded in a bladder diary. Results for patients younger than 75 years of age

(n = 485) and those 75 years of age or older (n = 98) were compared.

The reductions in micturition frequency were similar between younger and older patients, but the response to therapy for urge incontinence (reduction in the number of incontinence episodes) was significantly greater in older patients compared with younger patients ($P < 0.02$) (Figure 1). Using these response data as a basis for sample size calculation with an 80% power to detect a 0.05 level of significance, the age-dependent nature of these efficacy outcomes is evident. When using frequency as an outcome measure, sample sizes of 50 and 60 patients are necessary for evaluating young and geriatric patients, respectively. With urge incontinence, a greater difference in the numbers of patients is necessary to detect a significant difference in response (n = 140 in young patients, n = 80 in geriatric patients), illustrating that urge incontinence among the geriatric population is a more sensitive outcome measure than it is among younger patients.

Figure 1. Effect of Oxybutynin Therapy on Micturition Frequency and Urge Incontinence Episodes After 6 to 8 Weeks of Treatment in Women Younger than 75 Years and 75 Years of Age and Older



Source: J. Malone-Lee, unpublished data.

Implications of OAB in Managed Care

Data collection from large managed care databases has allowed detailed evaluations of demographics and the distribution of disease among certain populations. Recently, in an effort to characterize the numbers and types of women seeking care for pelvic floor disorders (PFD), the Southern California Kaiser Permanente Medical Group conducted a retrospective database review of women seeking

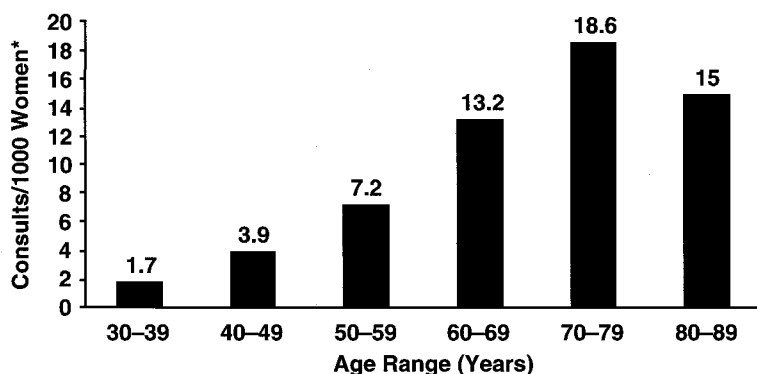
care for urinary incontinence and pelvic floor prolapse within a managed care organization. Data were then extrapolated to estimate the number of women who could be expected to seek care for PFDs in the future (K. Luber, unpublished observations).

The Kaiser Permanente Medical Group includes more than 3000 physicians and is responsible for the medical care of more than 3 million members through the Kaiser Permanente Health Care System in Southern California. The San Diego area of this managed care organization includes a well-developed, identifiable continence program to which primary care physicians, gynecologists, and urologists are encouraged to refer patients who report PFD symptoms. Its continence program depends heavily on nursing support to provide care, so the costs associated with continence programs within a managed care organization may differ from those derived from other institutions in which care is managed mainly by physicians.

The study was conducted in the San Diego area, where Kaiser Permanente is responsible for the care of 251,000 women, of whom 145,000 are considered at risk for OAB (ie, between 30 and 89 years of age). Between June 1997 and May 1999, a total of 2072 women 30 to 89 years of age sought treatment for pelvic floor-related disorders. Analysis of symptoms by age showed a normal distribution, with a median age of 61 years. Stress incontinence was more common among women 30 to 49 years of age than among women 50 to 89 years of age (78% vs 58% of women; $P = 0.20$), whereas urge incontinence showed an inverse relationship (56% vs 57%; $P < 0.001$).

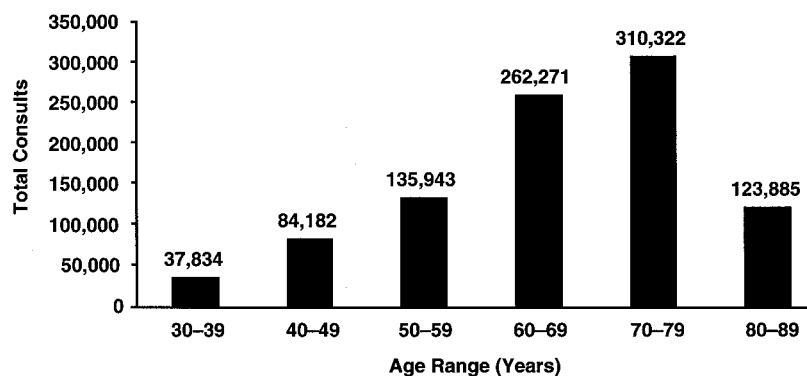
There was an age-related increase in the incidence of women seeking care for all PFD symptoms during this period, from 2 to 19 consults per 1000 woman-years in the 30- to 39-year-old and 70- to 79-year-old age groups, respectively (Figure 2). Applying

Figure 2. Number of Women (per 1000) Seeking Care for Symptoms of OAB at Southern California Kaiser Permanente Continence Program



Source: K. Luber, unpublished data.

Figure 3. Estimated Number of Women in the United States Seeking Care for Symptoms of OAB in the Year 2030



Source: K. Luber, unpublished data.

these data to those from the US Census Bureau middle series projections, researchers at Kaiser Permanente anticipate that this year, there will be more than 620,000 consults for PFD in the United States and that by 2030, we can anticipate more than 1 million consultations. According to these projections, there will be an 11% increase in women 30 to 59 years of age seeking care for PFD, consistent with the anticipated growth in the population. The greatest percentage increase in demand for services will occur among older women (60 to 89 years of age) where there is expected to be an 81% increase in demand for consults (Figure 3). These are conservative estimates, because they do not take into account changes in the characteristics of the women or increased public awareness of PFD, 2 factors that are expected to increase the number of people seeking help for PFD.

Implications of OAB in Long-Term Care

Nursing home staff consider urinary incontinence to be one of the most difficult conditions to manage, and they feel that a disproportionate amount of their time is spent caring for residents with urinary incontinence.¹⁰ Because urinary incontinence can result from other causes (eg, dementia or UTIs), some of the healthcare costs associated with it are more directly attributable to another disease.¹⁶ Labor, supplies, and laundry constitute the main costs associated with handling urinary incontinence in the institutionalized care setting, whereas the cost of treating skin irritations, UTIs, and falls and the costs of additional nursing home stays or hospitalization are typical consequence costs associated with urinary incontinence.^{16,17}

In 1983, estimated first-order costs (ie, supplies, laundry, and labor) associated with managing urinary incontinence in nursing homes were between \$3 and \$11 per incontinent patient per day, which equates to total annu-

al costs to all nursing homes in the United States of \$0.5 to \$1.5 billion.¹⁷ In 1992, the estimated annual burden of disease of urinary incontinence in nursing homes, in terms of direct costs, was \$5.2 million.¹⁸

A recent study estimated the incremental costs associated with caring for incontinent patients in long-term care facilities.¹⁹ The incremental cost approach used in this study compares the costs associated with caring for long-term care residents with and without urinary incontinence to examine the additional costs to long-term care facilities caused by urinary incontinence. To determine whether costs associated with urinary incontinence differed among level-of-care facilities, the study evaluated 3 levels of care at 6 facilities: skilled nursing facilities, intermediate care facilities, and rest homes. A 3-phase, prospective design was used for data collection. The first phase was a time and motion study to develop a taxonomy of caring activities, the second phase recorded the intensity of these activities over a 1-week period, and the third phase involved a survey questionnaire to be answered by nursing administrators to quantify each cost element. Primary variables included cost (ie, labor, supplies, laundry, activity-specific, aggregate), sociodemographic information (ie, age, gender, institutional history, payers), type of long-term care facility, shift of observation, International Classification of Diseases (ICD) codes, medication profile, and frequency of urinary or bowel incontinence.

Data were collected on 116 residents over the 1-week period (21 nursing shifts per patient, or 2436 shift observations). The estimated incremental labor costs associated with incontinence care, based on wage data, were more than \$11 per resident per day, or more than \$4000 annually. Labor costs were highest in skilled nursing homes and during day shifts. Using a fixed-effect model to control for resident sociodemographic

status, institutional characteristics, and shift, the estimated incremental total costs (labor, supplies, and laundry) were more than \$15 per patient per day, or more than \$5000 annually. Costs also varied, depending on the frequency of urinary incontinence; increased urinary incontinence was associated with higher costs than infrequent incontinence. Residents with occasional and frequent urinary incontinence had increases of \$8.70 and \$17.28 in costs per resident per day, respectively. Because of the limitations of this study (small patient population and small number of facilities recruited), the results must be confirmed on a larger scale. Additionally, future longitudinal studies that capture transitions between the community and the institution and other specific variables (eg, demographics, socioeconomic status, additional expenditures, urinary incontinence status, and quality of life) would be beneficial in more accurately estimating the costs of urinary incontinence in the institutional as well as the non-institutional care setting.

Treatment of OAB in the long-term care setting is challenging. Long-term care residents tend to be frail, with impairments in cognitive and physical functioning, and need assistance in toileting. Behavioral management includes bladder training, which requires good cognitive function for implementing appropriate techniques. Because of a higher prevalence of dementia among incontinent long-term care residents, scheduled or prompted voiding may be more effective.

A multicenter study evaluated the use of a prompted voiding regimen among 191 nursing home residents with basic cognitive functioning and documented urinary incontinence.²⁰ Hourly wet checks were performed every day for 3 days to determine the degree of baseline incontinence. Residents wore preweighed disposable briefs or were placed on

preweighed disposable pads. A calculated volume of 5 mL or greater was documented as having an incontinent episode. Prompted voiding (every 2 hours from 7:00 AM to 7:00 PM) was carried out by trained research nurse's aides for 7 days, and wet checks were conducted on days 5 through 7. Responders to the voiding regimen were identified if they had an average of one or fewer wet episodes during the final 3 days of the 7-day trial. Prompted voiding was continued for an additional 9 weeks (5 days per week) in responsive residents. A total of 40% of residents were considered responders. Among these responders, reductions from baseline in the percentage of incontinent episodes were 76% at the end of the first week and 64% at the end of the 9-week period. Most residents were identified as responders during the first 3 days of prompted voiding.

A major drawback to the widespread acceptance of prompted toileting is the increased time and effort required of the nursing staff to assist patients. Using the methods described in the aforementioned study, prompted voiding would require 3 to 4 times the amount of nursing time compared with changing a patient. Moreover, when toileting assistance is no longer provided, long-term care residents immediately become incontinent again. As a result, it is necessary to develop means by which the effectiveness of prompted voiding can be maintained over time. The use of wetness sensors, placed in the resident's diaper, may be an alternative treatment strategy. Such sensors can send a wireless transmission to a computer at the nursing station. Data collected from this sensor can provide information on the time and frequency of wetness and, as a quality assurance measure, how long it takes for the resident to be changed. Wetness sensor feedback also can be used to provide prompt intervention for residents who are prone to skin breakdown.

Because of the high prevalence of functional deficits among the frail geriatric population, the use of pharmacotherapy alone for urinary incontinence is generally ineffective in the absence of systematic toileting assistance (J.G. Ouslander, unpublished observations). However, pharmacotherapy may be an effective alternative in patients with incontinence that does not respond well to prompted voiding alone. In a placebo-controlled crossover study, approximately one third of the nursing home residents who did not respond to prompted voiding responded when pharmacotherapy was added.²¹ Research is currently in progress to evaluate the effectiveness of tolterodine in OAB among nursing home residents.

The patient's or family's preference is an important consideration before implementing any treatment strategy for management of incontinence in long-term care. One survey revealed that in many cases the patient or family may prefer noninvasive strategies, such as diapers, to toileting programs or pharmacotherapy.

Conclusion

Overactive bladder is a highly prevalent condition among the geriatric population, and its presence is associated with the use of substantial healthcare resources and economic costs. Within the next 30 years, it is expected that the demand for services related to OAB will increase dramatically. Treatment of OAB is challenging and depends on several factors, including the age of the patient, cognitive functioning, and the degree of mobility.

Pharmacotherapy is a viable option for the treatment of OAB. However, clinicians must be aware of the efficacy, safety, and tolerability issues associated with the agents used to treat OAB. Older patients may have a more pronounced response to therapy than younger patients. In addition, the known side-effect profile of each agent

should be considered when selecting appropriate pharmacotherapy.

Treatment of OAB in the institutionalized care setting is expensive, with labor, supplies, and laundry constituting the greatest proportion of costs. Prompted voiding can be extremely effective in reducing the number of incontinent episodes for those in institutionalized care; however, this practice is labor intensive and generally is effective in only 40% of cases. Moreover, assistance with prompted voiding must be maintained continuously. Future research should be aimed at exploring the most cost-effective methods of treating OAB in the geriatric population.

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