Potentially inappropriate anticholinergic medication use in older adults with dementia

Nandita Kachru, Ryan M. Carnahan, Michael L. Johnson, and Rajender R. Aparasu

Abstract

Objective: To examine the prevalence and predictors of potentially inappropriate anticholinergic medication use in older adults with dementia.

Design: A cross-sectional study.

Setting: United States, 2009–2010.

Participants: Medical Expenditure Panel Survey participants aged 65 years or older identified as having dementia.

Main outcome measures: Prevalence and predictors of potentially inappropriate anticholinergic medication use as per the updated 2012 American Geriatrics Society Beers criteria.

Results: A total of 3.78 million older adult patients (95% confidence interval [CI] 3.17 million to 4.38 million) were identified as having dementia, for an overall prevalence of 4.81%. Of those patients, an estimated 1.02 million (95% CI 0.70 million to 1.30 million) were reported to use potentially inappropriate anticholinergic medications, for an overall prevalence of 26.95% (95% CI 20.10% to 33.79%). The most frequently prescribed drugs were oxybutynin, solifenacin, paroxetine, tolterodine, promethazine, and cyclobenzaprine. Multivariable logistic analysis revealed that patients with the need characteristics of self-reported anxiety, mood disorders, and "fair/poor" general health status had increased odds of potentially inappropriate anticholinergic use, while patients with the predisposing characteristic of being aged 75–84 years had decreased odds of potentially inappropriate anticholinergic use.

Conclusion: More than one in four older adults with dementia were found to use potentially inappropriate anticholinergics. Given the adverse cognitive effects of these medications, there is a strong need to monitor and optimize their use in older adult patients with dementia.

J Am Pharm Assoc. 2015;55:603–612.
doi: 10.1331/JAPhA.2015.14288

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Disclosure: The authors declare no relevant conflicts of interest or financial relationships.

Previous presentation: Poster presentation at International Society for Pharmacoeconomics and Outcomes Research 19th Annual International Meeting, Montreal, QC, Canada, May 31–June 4, 2014

Received December 29, 2014. Accepted for publication June 30, 2015. Published online in advance of print October 23, 2015.

Potentially inappropriate prescribing encompasses the use of medications that pose greater potential harm than benefit.[1] Literature suggests that potentially inappropriate prescriptions lead to adverse events, which occur more frequently in the older adult population than in the general population.[2] To date, several criteria and tools have been developed to classify potentially inappropriate medications for the treatment of older adults, including the Beers criteria,[1] the Improving Prescribing in the Elderly Tool (IPET),[3] the Screening Tool of Older Persons' Prescriptions (STOPP),[4] McLeod's criteria,[5] and the Medication Appropriateness Index (MAI).[6]

The Beers criteria, which was initially developed in 1991,[1] is often used to evaluate the quality of geriatric care. In 2012, the American Geriatrics Society (AGS) updated the Beers criteria based on input from an interdisciplinary panel of 11 experts in geriatric care. The 2012 AGS Beers criteria includes three categories: 1) medications to avoid in older adults in general, 2) medication classes to avoid in older adults with certain diseases and syndromes, and 3) medications to be used with caution in older adults.[7] A considerable number of medications included in the updated Beers list are considered potentially inappropriate because of their anticholinergic activity.[8]

Anticholinergic medications are commonly prescribed in older adults for the treatment of allergies, behavioral problems, depression, Parkinson disease, psychotic symptoms, and urinary incontinence.[9,10] Based on their therapeutic activity, anticholinergics are broadly classified into two categories: drugs that are specifically used for their anticholinergic properties (e.g., antiparkinsonians, antispasmodics, and antimuscarinics such as atropine or oxybutynin) and drugs with anticholinergic properties that are not fundamental to their primary indication (e.g., antihistamines, antipsychotics, and antidepressants such as amitriptyline or brompheniramine).[10]

Anticholinergic use is associated with a range of peripheral and central side effects.[9–12] Peripheral side effects include blurred vision, constipation, dry mouth, impaired sweating, nausea, tachycardia, and urinary retention.[9] Central anticholinergic effects include agitation, confusion, delirium, hallucinations, and memory deficits.[9] These adverse effects are of significant concern in older adults because of polypharmacy,[11] comorbidities,[11] and age-related changes in pharmacokinetics and pharmacodynamics parameters.[12] Drugs with anticholinergic side effects are therefore generally considered potentially inappropriate for prescribing in the older adult population.[13]

Anticholinergic medication use in older adult patients with dementia raises particular concerns because of the pathophysiology of the condition and the mechanism of action of anticholinergic medications. Patients with dementia experience progressive cognitive decline due to damage to the cholinergic neuronal system, and the central adverse effects of anticholinergic medications can lead to further cognitive function impairment.[14,15] Consequently, older adult patients with dementia are more susceptible to developing anticholinergic medication-induced cognitive impairment and other adverse effects compared with the general population.[16,17]

Previous research has shown the association between anticholinergic medication use and cognitive decline, delirium, and dementia in the general older adult population. A meta-analysis of 27 studies conducted by Campbell et al. (2009) found that anticholinergic medications negatively affect the cognitive performance of older adults.[18] Also in 2009, Carriere et al. evaluated cognitive performance and dementia diagnosis at baseline, 2 years later, and 4 years later and found that older adults taking anticholinergic drugs were at increased risk for cognitive decline and dementia.[19]

Key Points

Background:

- Anticholinergic medication use in older adults with dementia is of significant concern because these patients experience progressive cognitive decline, and the central adverse effects of anticholinergics can lead to worsening of cognition.
- Although several previous studies have reported on anticholinergic medication use in older adults with dementia, none have focused on the use of potentially inappropriate anticholinergic medications in national samples of this population.

Findings:

- An estimated 1.02 million older adult patients with dementia in the United States used potentially inappropriate anticholinergic medications between 2009 and 2010, for an overall prevalence of 26.95%.
- Patients' need characteristics (self-reported anxiety, mood disorders, and "fair/poor" general health status) and predisposing factors (age) both influenced the use of potentially inappropriate anticholinergic medications in older adults with dementia.
- With increasing dementia burden, there is a strong need to optimize the use of potentially inappropriate anticholinergic medications in older adults with dementia by prescribing drugs with minimal anticholinergic activity or nonpharmacological alternatives.