



Original Research Article

Assessment of the Anticholinergic Burden in the Elderly: A Viable Concern?

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Abstract: Anticholinergic burden refers to the cumulative effects of taking one or more drugs with anticholinergic properties. This concern is especially relevant in the elderly, where physiological changes, comorbidities, and polypharmacy increase the risk of adverse outcomes. This paper critically reviews the prevalence, measurement, and clinical impact of anticholinergic burden in older adults, evaluates current assessment tools, and discusses strategies for minimizing harm. Prevalence data and graphical analysis are presented to support clinical decision-making. Recommendations for practice and research are highlighted.

Keywords: Anticholinergic burden, Older adults, Polypharmacy, Adverse outcomes, Assessment tools.

INTRODUCTION

Polypharmacy is prevalent among older adults, often leading to an increased intake of medications with anticholinergic properties. These medications, while sometimes necessary, are linked to a range of adverse effects due to their antagonistic action on acetylcholine receptors. Adverse events can significantly impact cognitive and physical function, making the assessment and monitoring of anticholinergic burden essential within geriatric care^{[1][2][3]}.

THE ANTICHOLINERGIC BURDEN: DEFINITIONS AND MECHANISMS

What Is Anticholinergic Burden?

Anticholinergic burden (ACB) is defined as the cumulative negative effect resulting from the intake of one or more drugs with anticholinergic properties. These drugs block acetylcholine, a neurotransmitter essential for memory, learning, and muscle function. Medications with anticholinergic activity are used to treat various conditions—including depression, allergies, urinary incontinence, Parkinson's disease, and certain gastrointestinal disorders—but can cause unintended central and peripheral nervous system effects^{[1][2]}.

Why Are Older Adults Vulnerable?

Age-related changes in pharmacokinetics and pharmacodynamics, coupled with comorbidities and decreased organ function, heighten older adults' susceptibility to the adverse effects of anticholinergic medications. Reduced renal

and hepatic function, lowered cholinergic neuron density, and increased blood-brain barrier permeability all contribute to risk^{[2][3]}.

CLINICAL IMPACT OF ANTICHOLINERGIC BURDEN IN THE ELDERLY

Cognitive Impairment and Dementia Risk

Research consistently links a high anticholinergic burden to cognitive impairment and an increased risk of dementia. Study findings suggest that older adults with a severe anticholinergic burden have a significantly greater risk—up to 227% higher—of developing cognitive dysfunction or dementia compared to those not exposed to such medications^{[4][3]}. The risk appears to be dose-dependent and may not be entirely reversible upon discontinuation.

Physical and Functional Decline

Longitudinal studies demonstrate that sustained high use of anticholinergic medications correlates with accelerated physical decline, including reduced walking speed and grip strength. In some cases, this decline is equivalent to the effect of one additional year of biological aging. Falls, frailty, and mobility impairments are strongly associated with high anticholinergic load in elders^{[5][6][7]}.

Other Adverse Effects

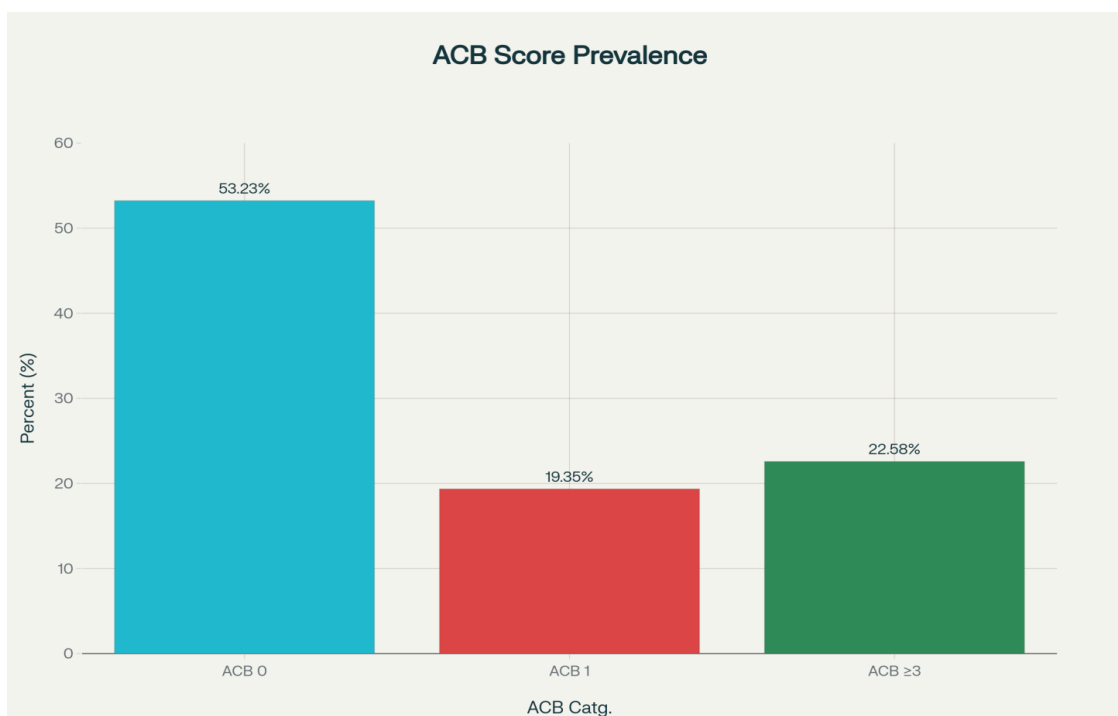
Common anticholinergic side effects include dry mouth, constipation, urinary retention, blurred vision, dizziness, confusion, increased heart rate, and hallucinations. These outcomes can lead to lower quality of life, increased hospitalization, and higher mortality rates^{[2][8]}.

Prevalence of Anticholinergic Burden Among Elders

Studies estimate that 30–50% of elders are prescribed medications with anticholinergic activity. Prevalence of clinically significant anticholinergic burden (ACB score ≥ 3) ranges from 7–23% in different populations, emphasizing the substantial exposure among older adults^{[9][10][11]}.

Prevalence data from a clinical study indicates the following distribution of ACB scores among elderly patients:

- **No Anticholinergic Burden (ACB Score 0):** 53.2%
- **Low Burden (ACB Score 1):** 19.4%
- **Clinically Significant Burden (ACB Score ≥ 3):** 22.6%^[10]



Prevalence of Anticholinergic Cognitive Burden (ACB) Scores in Elderly Patients

Assessment Tools: Measuring Anticholinergic Burden

Anticholinergic Burden Scales

Multiple validated assessment tools exist to quantify anticholinergic burden, including:

- **Anticholinergic Drug Scale (ADS)**
- **Anticholinergic Cognitive Burden scale (ACB)**
- **Anticholinergic Risk Scale (ARS)**
- **Drug Burden Index (DBI)**
- **CRIDECO Anticholinergic Load Scale (CALS)**

These tools differ in their methodology, included drugs, and risk stratification approaches. Some account for drug dosage (e.g., DBI), while others are based on expert consensus regarding the anticholinergic potential of medications. Assessment scales tend to show reasonable correlation, but the same patient may be classified differently depending on the scale used^{[12][13][14][11]}.

Comparative Accuracy and Clinical Utility

A review of published scales found that the ACB and the DBI demonstrate the strongest association with clinical outcomes such as cognitive decline and falls^{[11][14][15]}. However, there is still no universal gold standard, and the validity of all scales can vary by setting, patient condition, and drug regimen.

A recent AI-based tool—the International Anticholinergic Cognitive Burden Tool (IACT)—uses chemical structure and adverse event data to improve assessment, but requires broader validation before widespread adoption^[16].

Clinical Management: Reducing the Anticholinergic Burden

Medication Review and Deprescribing

Routine medication review is crucial for identifying unnecessary anticholinergic drugs and mitigating their risks. Deprescribing (systematic withdrawal) can improve cognitive and physical function and lowers the risk of adverse events^{[11][5][17]}. Key strategies include:

- Replacing anticholinergic drugs with non-anticholinergic alternatives where possible.
- Using the lowest effective dose and shortest duration.
- Regular reevaluation of therapy necessity.
- Engaging multi-disciplinary teams for holistic medication management.

Guidelines and Practice Recommendations

Many clinical guidelines advocate minimizing anticholinergic exposure in the elderly, particularly those with dementia, delirium, or high risk of falls. Using validated assessment tools as part of comprehensive geriatric assessment supports individualized care and enhances safety^{[18][19][8]}.

DISCUSSION

The consistent association between anticholinergic burden and negative outcomes in the elderly underscores the importance of regular assessment and targeted intervention. While the use of anticholinergic drugs may be necessary for managing certain conditions, clinicians must balance therapeutic gains with the risk of significant harm. Implementing standardized assessment tools and deprescribing protocols is pivotal for improving quality of life and outcomes in older populations.

CONCLUSION

Anticholinergic burden is a significant, quantifiable, and modifiable risk in geriatric medicine. Comprehensive evaluation using validated assessment tools, regular medication reviews, and individualized care planning can mitigate its adverse effects. Widespread attention to this issue, coupled with ongoing research and improved clinical guidelines, is critical to the safe and effective management of older adults.

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