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Donepezil-Associated Bradycardia in An Elderly Patient with Dementia: A Case Report

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ABSTRACT

Acetylcholinesterase inhibitors are commonly prescribed for the management of Alzheimer's disease and other dementias [1]. While generally well tolerated, these agents may cause serious cardiovascular adverse effects, particularly in frail older adults [2]. We report a case of symptomatic bradycardia and hypotension in an 85-year-old patient with dementia associated with donepezil use, which resolved after discontinuation of the medication [3].

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Introduction

Alzheimer's disease primarily affects individuals over the age of 65 and is characterized by progressive cognitive decline, including memory impairment, confusion, mood changes, and behavioral disturbances [4]. Acetylcholinesterase inhibitors-such as donepezil, rivastigmine, and galantamine-are commonly used to manage symptoms [5]. Although these agents do not reverse cognitive decline, approximately 50% of patients may experience a temporary delay in symptom progression for six months to one year [6]. Common adverse effects include gastrointestinal symptoms, dizziness, and muscle cramps. However, frail elderly patients are at increased risk for serious cardiovascular complications, including bradycardia, atrioventricular (AV) block, syncope, and seizures [7].

Case Presentation

An 85-year-old male with a known history of dementia presented to the emergency department with dizziness and lightheadedness. On arrival, vital signs revealed a heart rate in the low 40s and a systolic blood pressure in the 80s mmHg. The patient denied chest pain, shortness of breath, or recent illness.

Electrocardiography demonstrated sinus bradycardia without acute ST-T wave changes. There was no evidence of heart block or dysrhythmia. Initial cardiac workup, including cardiac enzymes, was unremarkable. Chest radiography showed no acute pathology, and laboratory studies revealed no electrolyte abnormalities [8].

The patient's medical history was significant only for dementia, for which he was taking donepezil 10 mg daily. He was not on beta-blockers or other rate-limiting medications and had no known history of coronary artery disease or congestive heart failure. Otherwise, he was considered medically stable and functional for his age.

Management and Outcome

The patient received one dose of intravenous atropine, resulting in a transient improvement of heart rate to the 70s; however, bradycardia recurred within minutes. Due to persistent symptomatic bradycardia and hypotension, an intravenous epinephrine infusion was initiated [9]. Donepezil was discontinued, and a pacemaker implantation was considered if bradycardia persisted following discontinuation of the acetylcholinesterase inhibitor [10].

Over the subsequent 48 hours, the patient was successfully weaned off the epinephrine infusion. His heart rate normalized, and symptoms resolved completely. No pacemaker was required. The patient remained hemodynamically stable and was discharged with instructions to avoid acetylcholinesterase inhibitors.

Discussion

Acetylcholinesterase inhibitors enhance cholinergic activity, which may increase vagal tone and precipitate bradycardia, particularly in older adults with limited physiological reserve [11]. Although these medications offer modest cognitive benefits, their potential for serious adverse cardiovascular effects warrants careful consideration [12]. This case highlights the importance of recognizing medication-induced bradycardia as a reversible cause of hemodynamic instability [13].

Conclusion

Primary care physicians and specialists should exercise caution when prescribing acetylcholinesterase inhibitors to frail elderly patients [14]. Given the modest therapeutic benefit and the potential for severe adverse reactions, close monitoring and regular reassessment of risk versus benefit are essential. Early recognition of medication-induced bradycardia can prevent unnecessary invasive interventions such as pacemaker implantation.

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