

Anticholinergic properties and cognition, relevancy to individuals with Parkinson's Disease (PD)

Definitions:

- **Acetylcholine:** a chemical in the brain that causes muscles to contract, activates pain responses and regulates endocrine (i.e., hormones) and sleep functions.
 - a. **Excessive** accumulation of **acetylcholine** within the body can result in cramps, increased salivation, lacrimation (tears), muscular weakness, paralysis, muscular fasciculation (twitching or flickering of muscle fibers), diarrhea, and blurry vision.
- **Anticholinergic medications:** An anticholinergic agent is a substance that blocks the action of the neurotransmitter (neurochemical) acetylcholine at synapses in the body thereby reducing spasms of smooth muscles (for example, muscles in the bladder).
- **Cognition:** The mental action or process of acquiring knowledge and understanding through thought, experience, and the senses. Thought processes including attention, management of complex information and problem solving, memory, language skills, and visual processing.
- **Dementia:** Dementia is not a specific disease. It's an term that describes a group of symptoms associated with a decline in memory and other thinking skills severe enough to reduce a person's ability to perform everyday activities. There are many conditions that can cause dementia.

SUMMARY POINTS

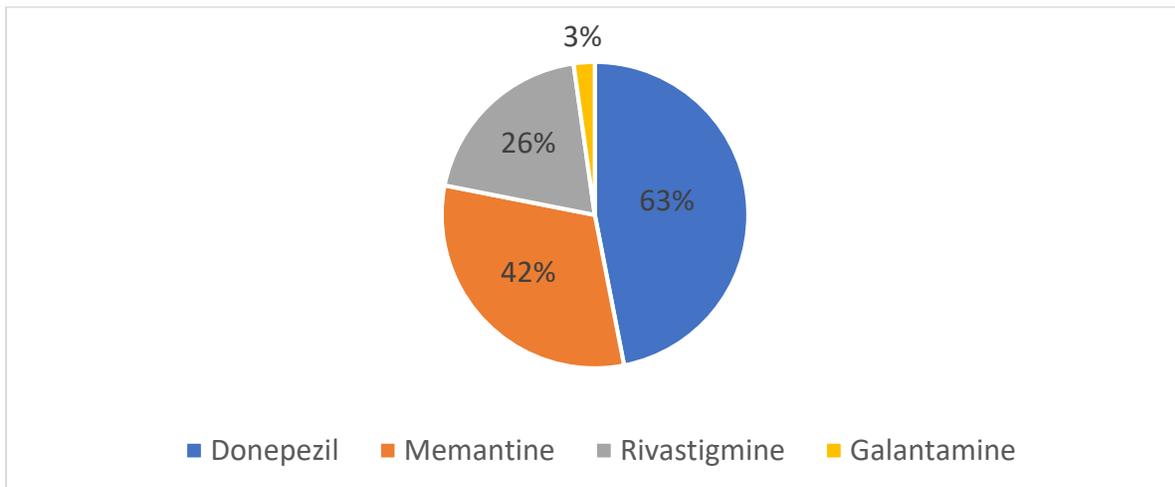
Medications with anticholinergic activity are used in 8-37 % of older adults to treat various medical conditions that involve contraction and relaxation of muscles, such as PD and overactive bladder, as well as other conditions including seasonal allergies and depression/psychosis.

Several studies have examined the risks associated with anticholinergic use in older adults on cognitive functions and dementia, four of which are summarized below.

Anti-dementia Medications and Anticholinergic Medication Effects:

- Cognitive impairment is a common non-motor symptom of Parkinson's Disease, with most patients developing dementia in the second decade after diagnosis. Cognitive impairment, including dementia, is often treated with antidementia medication (see Figure 1), however combining this medication with anticholinergic medication can be considered a prescribing error due to their opposite effect on the brain¹.

Figure 1. Common medications (cholinesterase inhibitors) prescribed for dementia



- Donepezil is also known as Aricept; Memantine is also known as Namenda; Rivastigmine is also known as Exelon; Galantamine is also known as Razadyne

- Almost 1 in 4 individuals with PD who were prescribed an anti-dementia medication was also prescribed an acetylcholinesterase inhibitor.
- Dementia medication use was associated with increased age and comorbid diagnosis of dementia, depression, hip/pelvic fracture, and stroke.
- Black/Hispanic patients had higher odds of being prescribed dementia medication and female sex and native Americans had lowest odds of dementia medication use.
- Polypharmacy (too many medications) and inappropriate medication prescribing is a major problem in treatment of older adults. Taking an individualized patient approach is important to prevent potential prescription problems.

Anticholinergic Medication Effects on Cognition:

- One study with almost 7000 participants revealed that adults 65 years of age or older who were taking anticholinergic drugs were at increased risk for cognitive decline and dementia².
 - At the start of the study, 7.5% of adults reported anticholinergic use, with women reporting greater cognitive decline over 4 years, especially on tasks of verbal fluency (generating words), compared to more decline on visual memory tasks for men.
- In another study, cumulative anticholinergic exposure over the past 10 years was examined in a sample of 3,434 participants 65 years or older without dementia³.

- The most common anticholinergic medications included antidepressants, antihistamines and bladder antimuscarinics.
- At follow up (mean 7 years), 23% of participants developed dementia and 80% of them had possible or probable Alzheimer's disease.
- Participants with the highest exposure to anticholinergic medications had significant increased risk for dementia or AD, compared to those with no use.
- There was no significant relationship with gender, age at the beginning of the study or genetic markers (APOE ε4), and anticholinergic medication subtype did not influence risk.

Falls and Anticholinergic Medications:

- Research has found that falls are more common when anticholinergic drugs are used⁴:
 - 63% of participants used one or more anticholinergic drugs and 18% experienced a fall or fall-related injury.
 - Low potency anticholinergic drugs increased the hazard of fall or fall-related injury.

REFERENCES:

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