# ANTIMUSCARINICS AND COGNITION – CAN WE DETECT A "REAL-LIFE" ASSOCIATION?

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**Background:** Antimuscarinics are the pharmacological mainstay of OAB treatment, but anticholinergic medications have been associated with potential cognitive side effects, although reports conflict. Cognitive impairment and risk of incident dementia in community dwelling older people has been reported [1]. In contrast, anticholinergic medications do not appear to exhibit the same relationship with cognition in those diagnosed with dementia and [2] and bladder antimuscarinics do not appear to be associated with impaired cognition or delirium in nursing home residents [3].

**Aim:** To examine the association of anticholinergic burden with cognitive and physical function, including bladder and/or bowel incontinence and toileting independence, in people referred to an ambulatory seniors' clinic.

**Study design and methods:** Retrospective chart audit of older adults seen in a geriatric assessment clinic.

**Samples:**

N=100 consecutive patients referred for cognitive assessment seen between Jan 1 -April 19, 2011.

N=100 patients with a prior diagnosis of dementia, seen between Jan 1, 2011 - May 9, 2011 (comparative sample).

Data on age, sex, Mini Mental Status Exam (MMSE) and Montreal Cognitive Assessment (MOCA), medication history at time of assessment and recommendations to reduce or increase dosage/quantity of anticholinergic medications abstracted. *Anticholinergic Risk Scale* (ARS), *Charlson Comorbidity Index* (CCI) and *Barthel Index* (BI) (activities of daily living were calculated. Data from each sample was split into users and non-users of anticholinergic medication based on the ARS and compared by the non-parametric Wilcoxon Mann-Whitney U Test. The Spearman test used for correlations between anticholinergic and cognitive/physical function variables.

Table 1: Correlations between ARS and cognitive and ADL function

| ARS associations | | | | |
|---|---|---|---|---|
| | Spearman correlation Cognitive Assessment Sample N=100 | | Spearman correlation Established Dementia Sample N=100 | |
| **Population Characteristic** | $r_s$ (95% CI) | p value | $r_s$ (95% CI) | p value |
| **MMSE** | 0.02 (-0.18,0.21) | 0.86 | -0.05 (-0.24,0.15 | 0.64 |
| **MOCA** | -0.09 ( -0.40, 0.24) | 0.6 | -0.02 (-0.32,0.27) | 0.88 |
| **Barthel Index** | -0.18 (-0.36,0.032) | 0.0735 | -0.18 (-0.36,0.02) | 0.074 |
| Feeding | -0.15 (-0.34,0.05) | 0.1355 | -0.15 (-0.34,0.05) | 0.1387 |
| Toileting | -0.09 (-0.29,0.10) | 0.351 | -0.16 (-0.35,0.03) | 0.1016 |
| Bowel incontinence | -0.15 (-0.34,0.05) | 0.132 | -0.15 (-0.33,0.05) | 0.1445 |
| Bladder incontinence | -0.13 (-0.32,0.06) | 0.1864 | -0.08 (-027,0.12) | 0.4432 |
| Bathing | -0.14 (-0.33,0.065) | 0.1526 | **-0.21 (-0.39,-0.02)** | **0.0323** |
| Grooming | 0 (-0.20,0.2) | 0.9937 | -0.10 (-0.29,0.10) | 0.3459 |
| Dressing | -0.06 (-0.26,0.14) | 0.5344 | -0.14 (-0.33,0.06) | 0.1583 |
| Transfers | 0.02 (-0.17,0.22) | 0.819 | 0.02 (-0.17,0.22) | 0.8089 |
| Mobility | 0.07 (-0.12,0.27) | 0.4677 | 0.03 (-0.16,0.23) | 0.7412 |
| Stairs | -0.06 (-0.25,0.14) | 0.5484 | -0.06 (-0.25,0.14) | 0.5616 |
| **CCI** | 0.15 (-0.04,0.34) | 0.126 | 0.11 (-0.09,0.30) | 0.30 |

**Results:** There were no significant differences in age, sex, medication numbers, ARS, BI, CCI, MMSE, or MOCA scores between the two groups. Median age 81 years, and half (50%) of each group were taking medication with anticholinergic effects. There was no statistically significant association between ARS with either MMSE or MoCA in either sample (Table 1). Higher ARS scores negatively correlated with overall BI scores in both groups, but only bathing significantly negatively correlated with ARS in the group with established dementia. There were no significant correlations between anticholinergic burden and bladder/bowel incontinence or toileting.

**Interpretation:** There was little association between increased anticholinergic burden and cognitive and ADL function, including continence and toileting. Larger sample sizes may be needed to detect such associations. Any relationship that potentially exists would be better explored prospectively with multiple time point measures to look for change over time. These data cast further doubt upon the association between anticholinergic burden and cognitive impairment

**Concluding message**: An effect of anticholinergic burden on cognition has been reported, but we did not identify any association in our data. Further adequately powered prospective studies of anticholinergic burden on ADL function, including continence and independence in toileting, are needed to determine if a causal relationship exists.

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