

Data Impact Challenge Answer Submission

Question: **6d. Antipsychotics for Dementia**

Team and list of all team member names: **Team ICES UofT**

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Data sources

- Data Custodian Organization(s) and data sources:
 - Institute for Clinical Evaluative Sciences (ICES)
- List of Datasets Used (e.g. names of database and/or data origins):
 - Discharge Abstract Database (DAD) of inpatient hospitalizations, provided by Canadian Institute for Health Information (CIHI) and the Ontario Ministry of Health and Long Term Care (MOHLTC)
 - Ontario Health Insurance Plan (OHIP) database of physician services, provided by MOHLTC
 - Registered Persons Database (RPDB) of Ontarians eligible for health insurance and demographic information, provided by CIHI and MOHLTC
 - Ontario Drug Benefits (ODB) database of outpatient drug prescriptions dispensed, provided by MOHLTC. All Ontarians aged 65 and over are eligible for drug coverage under ODB
 - Drug Product and Therapeutic Class Database (DPTCD), produced by Brogan Inc., Ottawa
 - Ontario Mental Health Reporting System (OMHRS) database of inpatient mental health hospitalizations, provided by CIHI and MOHLTC
 - Continuing Care Reporting System (CCRS) database of clinical and demographic information on persons receiving Long Term Care (LTC) – a residence providing 24-hour nursing services. Clinical data are collected using the Resident Assessment Instrument Minimum Data Set (RAI-MDS) assessment instrument. CCRS is provided by CIHI and MOHLTC
 - These datasets were linked using unique encoded identifiers and analyzed at the Institute for Clinical Evaluative Sciences (ICES)
- Nature and Size of Cohort (e.g. geographic area covered, number of patients included):
 - All residents of Ontario aged 65+ diagnosed with dementia and not diagnosed with psychosis (N = 201,007)
- Data timeframe:
 - April 1, 2013 – Mar 31, 2014 (one fiscal year) – to collect numerator count of older adults prescribed an antipsychotic medication

- Exclusions:
 - Died on or before April 1 2013 (n = 54,893)
 - Not eligible for OHIP on April 1 2013 (n = 768)
 - Age < 65 on April 1 2013 (n = 35,278)
 - Had a diagnosis of psychosis (n = 28,876)

Methods

Study Design/denominator: We derived a cohort of older adults having dementia and estimated the proportion of these subjects who were prescribed antipsychotics in the fiscal year ending March 31, 2014. To define the dementia cohort, we applied an algorithm that included individuals with a dementia diagnosis from DAD or OMHRS; those having two physician visits within a two-year period (identified using OHIP); or those having an ODB record for any prescription of cholinesterase inhibitors (a class of cognitive enhancing drugs). Subjects who met any of these criteria in the two years prior to April 1, 2013, or in the observation year that followed were included in the dementia cohort, in order to capture both prevalent and incident cases of dementia. The same time period and algorithm were used to identify and exclude individuals who were diagnosed with psychosis or other conditions for which antipsychotics are indicated. The exclusion of these individuals focused our analysis on a population of patients where antipsychotic medicines were likely prescribed to treat the behavioural and psychological symptoms of dementia and may increase the risk of adverse health events. We also excluded subjects under age 65 and those who were not eligible for health coverage as of the start of observation.

Numerator: We identified subjects in the denominator having one or more prescriptions for an antipsychotic medication in ODB in a one-year period (April 1, 2013 - March 31, 2014).

Subgrouping: Using CCRS, we identified individuals in the denominator residing in Long Term Care (LTC) to contrast the use of antipsychotics in that setting with individuals dwelling in the community. Furthermore, we used RAI-MDS assessment data from CCRS to examine how prescription frequency varies by levels of behaviour and cognitive symptoms of dementia among LTC residents.

Analysis: The demographic data were summarized for non-LTC residents and LTC residents by calculating descriptive statistics. We estimated the proportion prescribed an antipsychotic for each group and stratified by age, sex, neighbourhood income level, rural/urban residence, level of comorbidity based on Johns Hopkins Aggregated Diagnosis Groups, and cholinesterase inhibitor use. For LTC residents, we also stratified by RAI-MDS elements: Aggressive Behaviour Scale (ABS), Cognitive Performance Scale (CPS), behavioural symptoms of resisting care and social inappropriateness, and use of physical restraints. The ABS measures frequency and intensity of verbal abuse, physical abuse, socially inappropriate or disruptive behaviour, and resistance to care. The CPS measures degree of cognitive impairment based on daily decision-making, short term memory, communication, and dependence in eating. Behavioural symptoms had to have been present in the seven days prior to RAI assessment; we examined the assessment performed closest to baseline (April 1, 2013). All analyses were conducted using SAS Version 9.4.

Results

There were 201,007 older adults living with dementia in Ontario in fiscal year 2013. The mean age was 82 years old and over half of the sample was female (62%). Approximately one third of these older adults (n = 58,286) were living in LTC residences. These individuals were older (mean age = 86 years) and had a higher proportion of females (71%) than non-LTC residents (n = 142,721, mean age = 81 years, 59% female).

The proportion of older adults with dementia (N = 201,007) that were prescribed an antipsychotic in fiscal year 2013 was 21%. Older adults with dementia in LTC had a higher proportion of antipsychotic prescription (39%) than non-LTC residents (13%); see Table. Among those dwelling in the community, there was an increasing trend of antipsychotic prescription with age (10% for age 65-74 vs 15% for age 85+), while in LTC the likelihood of prescription decreased with age (45% vs 35%). There was a significant gender difference present in LTC (44% of males prescribed vs 37% of females) that was not apparent in the community (12% vs 13%). The proportion prescribed did not vary by the income level of the neighbourhood. Older adults who had been prescribed a cholinesterase inhibitor to treat the symptoms of dementia were more likely to be prescribed an antipsychotic (27% vs 17%); this was especially true outside of LTC (18% vs 10%). In the community, those in highest quartile for comorbidity exhibited a higher proportion of antipsychotic prescription (15%) than those with lesser comorbidity (12%), while in LTC the opposite was true (36% vs 40%).

There were strong trends observed among LTC residents relating to the severity of the behavioural and cognitive symptoms of dementia. In particular, subjects exhibiting aggressive behaviour were much more likely to receive an antipsychotic prescription; 65% of those with an ABS score indicating severe aggressive behaviour were prescribed such, compared to 48% with more moderate aggression, and 27% with no aggressive behaviour. Those who were assessed to have behaved in a socially inappropriate or disruptive way were widely prescribed antipsychotics (60%) as compared to those who had not (35%). LTC residents were also more likely to receive antipsychotics if they were resistant to care or were physically restrained (see Table). A similar prescribing trend was also evident in those rated with severe cognitive impairment (47% prescribed vs 20% among the cognitively intact).

Interpretation

Through the use of administrative health databases at ICES, we examined all older adults living with dementia in both LTC and non-LTC settings. We found the proportion of older adults that received an antipsychotic prescription varied by age, sex, use of cholinesterase inhibitors, and level of comorbidity. The ADG measure of comorbidity is based on prior health care utilization. The LTC residents may appear to have less comorbidity if they are interacting with the health care system differently from non-LTC residents.

Rather than viewing LTC and non-LTC residents as distinct groups, it is important to recognize that these individuals exist on a continuum of dementia symptom severity, with community-dwelling older adults typically transitioning to LTC as dementia progresses (increased resistance to care, aggressive behaviour, and cognitive decline). We found that LTC residents with those symptoms had higher a higher proportion of antipsychotic prescriptions; although we could not assess this in the community-dwelling population, similar patterns may exist. The positive association between antipsychotic prescriptions and dementia symptom severity implies that those drugs are being used to manage the symptoms.

Limitations

There were some limitations to this project. Due to data limitations, we could not examine the motivations related to the prescription or if these drugs were limited to cases where non pharmacologic measures have failed. We cannot state that aggressive behaviour and/or cognitive performance lead to antipsychotic prescription; however, we did find that there were more older adults that received an antipsychotic prescription among LTC residents with higher levels of aggressive behaviour and/or cognitive impairment.

Acknowledgement

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Table: Percentage (%) of subjects prescribed an antipsychotic (Apr 1 2013 - Mar 31 2014) by long-term care (LTC) and community residence

		LTC resident N = 58,286	Not in LTC N = 142,721	Overall N = 201,007
Overall		39.0	13.0	20.5
Sex	Female	37.2	13.3	21.3
	Male	43.5	12.5	19.2
Age	65-74	45.3	10.3	15.4
	75-84	43.9	12.6	19.8
	85+	35.4	15.0	23.2
Neighbourhood income level	1 (lowest)	38.3	13.0	21.4
	2	38.7	12.8	19.7
	3	39.4	13.7	21.1
	4	39.1	13.0	20.5
	5 (highest)	39.9	12.6	19.8
Rural/urban residence	Urban	38.5	13.0	20.2
	Rural	42.1	13.0	22.4
Comorbidity level	Lower 75%	39.9	12.3	20.3
	Top 25%	36.1	15.1	21.3
Prescribed cholinesterase inhibitor	No	34.3	10.3	17.1
	Yes	47.0	18.0	26.7
Aggressive Behaviour Scale	None (0)	27.4		
	Mild/moderate (1-4)	47.5		
	Severe (>=5)	65.2		
Cognitive Performance Scale (Impairment level)	Cognitively intact (0-1)	19.6		
	Mild/moderate (2-3)	40.1		
	Severe (4-6)	47.3		
Resistance to care	No	30.9		
	Yes	51.1		
Socially inappropriate behaviour	No	34.6		
	Yes	59.9		
Physical restraints used	No	38.2		
	Yes	46.5		

Note: The smallest subgroup size was n = 1,785 (number of LTC residents with CPS of 0-1 who were prescribed an antipsychotic).