Development of a Claims-Based Algorithm to Identify Patients With Agitation in Alzheimer's Dementia

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Introduction

- Agitation is common in patients with Alzheimer's dementia, yet until recently, the lack of a consensus definition has limited our understanding of the prevalence, patient profile, and added healthcare burden of agitation in Alzheimer's dementia (AAD)[1]
- In 2015, the International Psychogeriatric Association (IPA) developed a provisional consensus definition of agitation in cognitive disorders[2]
- While the IPA consensus definition allows us to better understand agitation as a discrete syndrome in cognitive disorders, the application of the consensus definition against real-world data has not yet been completed

Objective

- The objective of this study was to develop a claims-based algorithm, based on the IPA definition of agitation, to identify patients with AAD using 100% of Medicare Fee-For-Service (FFS) administrative claims from 2010-2017
  - This presentation focuses on the prevalence of AAD identified using the algorithm, and compares the demographic and clinical characteristics of patients with AAD and those without AAD, and their frequently used treatments

Methods

Figure 1. Iterative Development of a Claims-Based AAD Algorithm Using the IPA Definition of Agitation[2]

A. Presence of confirmed diagnoses of both Alzheimer's Disease and Dementia using ICD diagnosis codes

B. Patient exhibits at least one of the behaviors associated with emotional distress (e.g., rapid changes in mood, irritability, or outbursts) persistent for ≥ 2 weeks
1. Excessive motor activity (pacing, rocking, restlessness, or repetitious mannerisms)
2. Verbal aggression (yelling, using profanity, or screaming)
3. Physical aggression (grabbing, pushing, resisting, hitting others, biting, or hitting self)

C.[a] Patient exhibits at least one behavior considered severe enough to produce excess disability such as significant impairment in:
1. Interpersonal relationships
2. Other aspects of social functioning
3. Ability to perform or participate in daily living activities

[a]Note: A review of the data revealed insufficient documentation related to these factors to apply Part C of the IPA definition

D. Exclude patients with psychiatric disorders that may be causing the agitation

ICD, *International Classification of Diseases.*

Methods (cont'd)

Data Source

- Data were extracted from 100% Medicare FFS Parts A and B and Part D Prescription Drug Event claims between July 1, 2010 and December 31, 2017

Constructing the Algorithm (Figure 1)

- The AAD identification algorithm was developed using an iterative process
- A: To confirm the underlying diagnosis, patients were required to have 2+ claims ≥30 days apart for both Alzheimer's disease and dementia, and continuous enrollment with medical/pharmacy coverage for 6 months pre-index and 12 months post-index diagnosis
  - The date of the first medical claim for the more recently used diagnostic code (Alzheimer's disease or dementia) was used as the index date
- B: The AAD cohort included patients with 2+ claims ≥14 days apart with ICD-9-CM/ICD-10-CM codes selected based on the IPA definition (e.g., dementia with behavioral disturbance, irritability/anger, restlessness/agitation, violent behavior, impulsiveness, wandering)
- C: Part C of the IPA definition (excess disability associated with agitation) was excluded because of a significant drop in sample size when applied; in a real-world reimbursement setting, physicians do not often code these characteristics in claims[3]
- D: To ensure that agitation is not attributable to another psychiatric disorder, patients with ≥2 medical claims for severe mental illness (schizophrenia, bipolar disorder, or major depressive disorder) ≥30 days apart were excluded

Patient Characteristics

- The algorithm was used to identify a representative sample of patients with AAD, estimate the prevalence of AAD, and compare these patients with those without AAD on the following variables:
  - Demographic and clinical profile
    - Hierarchical condition category risk score
  - Commonly used medications

Results

Table 1. Baseline Demographic Characteristics for AAD and Non-AAD Populations

Baseline Characteristics	AAD N = 255,669	Non-AAD N = 482,710
Age, years		
Mean (SD)	83 (8.0)	83 (8.0)
≥80 years, n (%)	183,890 (71.9)	355,566 (73.7)
Female, n (%)	176,308 (69.0)	340,626 (70.6)
Race, n (%)		
White	211,536 (83.7)	391,637 (82.3)
Black	29,207 (11.6)	54,753 (11.5)
Hispanic/Latino	6,895 (2.7)	15,769 (3.3)
Asian	4,171 (1.7)	11,954 (2.5)
North American Native	859 (0.3)	1,575 (0.3)
Unknown	3,001 (1.2)	7,022 (1.5)
Region, n (%)		
South	105,656 (41.4)	200,108 (41.6)
Midwest	59,652 (23.4)	112,769 (23.4)
Northeast	55,548 (21.8)	95,114 (19.8)
West	34,508 (13.5)	73,575 (15.3)
Unknown	305 (0.1)	1,144 (0.2)
Original Medicare Entitlement, n (%)		
Aged (≥65 years)	228,873 (89.5)	437,211 (90.6)
Disability	26,587 (10.4)	44,998 (9.3)
ESRD	85 (0.03)	215 (0.04)
Disability and ESRD	124 (0.05)	286 (0.1)
Dual Eligibility for Medicare and Medicaid, n (%)	112,565 (44.0)	191,171 (39.6)
CMS Hierarchical Condition Category Risk Score		
Mean (SD)	1.48 (1.77)	1.59 (1.97)

AAD, agitation in Alzheimer's dementia; CMS, Centers for Medicare & Medicaid Services; ESRD, end-stage renal disease; SD, standard deviation.

Figure 2. Study Population Flow Chart

AD Population
FFS: N = 2,739,568

Continuous enrollment*
FFS: N = 1,238,129; 54.8% excluded

Exclusion of patients with severe mental illness
FFS: N = 738,379; 40.4% excluded

AAD†
FFS: N = 255,669 (34.6%)

Non-AAD
FFS: N = 482,710 (65.4%)

AAD, agitation in Alzheimer's dementia; AD, Alzheimer's dementia; FFS, Fee-For-Service.
*Medical and pharmacy coverage from 6 months pre-index to 12 months post-index diagnosis of AD.
†The percentage represents the estimated prevalence of AAD as a proportion of patients with AD.

Table 2. Medications More Likely to Be Used by Patients With AAD Than Those Without AAD

Medication	AAD (%) N = 281,042	Non-AAD (%) N = 488,099	Relative Risk Ratio
Antipsychotics			
Quetiapine	13.2	5.5	2.42
Risperidone	8.0	3.4	2.37
Antidepressants			
Trazodone	6.7	4.0	1.66
Mirtazapine	7.3	5.4	1.36
Citalopram	9.2	7.1	1.30
Sertraline	8.1	6.4	1.27
Escitalopram	6.2	5.0	1.26
Dementia Treatments			
Rivastigmine	8.9	7.4	1.19
Memantine	30.2	27.1	1.12

AAD, agitation in Alzheimer's dementia.

Conclusions

- This algorithm characterized the similarities and differences between patients with AAD and those without AAD
  - Younger age (<80 years of age: 28.1% vs. 26.3%), male sex, and dual eligibility for Medicare and Medicaid (a proxy for low-income status) were more common among patients with agitation than those without
  - Use of antipsychotics, antidepressants, and dementia treatments was higher among patients with agitation than those without; the agitation population was more than twice as likely to be using certain antipsychotics (quetiapine, risperidone), supporting the algorithm's validity
- These findings suggest that patients with AAD can be identified using a claims-based algorithm that can be used to better understand the prevalence, patient profile, and added healthcare burden of agitation using real-world data
- This real-world evidence can be used to better understand this under-served population and thereby potentially facilitate early identification, improve outcomes, and/or reduce costs of care
- This algorithm is the foundation to a forthcoming analysis of healthcare resource utilization and cost differences between patients with AAD and those without AAD, as well as a validated predictive model that researchers and healthcare providers can use to identify other patients who are at high risk for AAD based on demographic and clinical characteristics

Limitations

- The prevalence of AAD may be underestimated using claims databases due to under-coding and imprecise coding; in another study, Halpern et al (2018)[4] used natural language processing in electronic health record provider notes (with a broader inclusion of key terms that suggested agitation) to estimate the prevalence of AAD to be around 45% (cf. 35% in our results)

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Disclosures

- Steve Hwang is an employee of Avanir Pharmaceuticals, Inc.
- Christie Teigland, Zulkarnain Pulungan, Alexis Parente: nothing to disclose.

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