Cognitive Impairment at Initial Diagnosis of Alzheimer's Disease: Patient Characteristics and Treatments in the Real-World Setting

Amanda G Althoff | Lawrence Rasouliyan
OMNY Health, Atlanta, GA

Background

- Alzheimer's disease (AD) is the most frequent type of neurodegenerative disease that develops over several years. It is characterized by multiple cognitive deficits that progress over time, including memory deterioration .[1]
- Drugs that target cholinergic or glutamatergic neurotransmission are available but only relieve the symptoms.[2] However, recently approved monoclonal antibodies have been shown to slow disease progression by around 30%.[3]
- The emergence of AD-related pathologic changes start to occur almost ten years before the appearance of symptoms. Thus, early diagnosis is needed for the timely initiation of therapy.[2]
- Patients' cognitive impairment and treatments at their initial diagnosis can help elucidate disease staging and treatments plans.

Objective

- To characterize patients with AD based on cognitive impairment at their first observed diagnosis and describe initial treatments in the real-world setting.

Methods

- A retrospective analysis (January 2017 to December 2024) of electronic health records of patients with AD (ICD-10: G30*) from integrated delivery networks in the US-based OMNY Health real-world data platform was performed.
- Patients were selected if they had a score recorded for either the Montreal Cognitive Assessment (MoCA) or Mini Mental State Exam (MMSE) within 30 days of their index AD diagnosis.
- Severity categorizations were based on the MOCA/MMSE scores as follows:
  - Normal: MMSE ≥ 25, MOCA ≥ 26
  - Mild: MMSE 20-24, MOCA 18-25
  - Moderate: MMSE 13-19, MOCA 10-17
  - Severe: MMSE <13, MOCA <10
- Demographics were tabulated at the AD index, and proportions of patients on various treatments within 30 days of index were generated.

Results

- Of the nearly 150,000 AD patients, 6,973 had a score for MOCA or MMSE in the time window of the index AD diagnosis.
- The distribution of cognitive severity categories in the study population (15% normal, 37% mild, 35% moderate, 13% severe) is presented in **Figure 1**.
- Patient demographic characteristics by cognitive impairment category are presented in **Table 1**:
  - With increasing cognitive impairment (normal, mild, moderate, severe), a monotonic increase in the proportions of female patients (51%, 60%, 64%, 67%) and nonwhite patients (15%, 17%, 22%, 27%) was observed.
  - Distributions of age (mean: 77-79 years) and ethnicity (93-97% not Hispanic or Latino) were similar between the severity categories.
- 59% of patients were treated with cholinesterase inhibitors or N-methyl-D aspartate receptor inhibitors at index; similar usage across severity groups was observed (**Figure 2**).
- 65% of patients had no prior AD treatment.
- Less than 1% of patients were treated with monoclonal antibodies at index.

Conclusions

- Early diagnosis and treatment are important in managing AD.
- Female and nonwhite patients tended to be more cognitively impaired at their first observed AD diagnosis.
- As newly approved drugs are used more, future analyses comparing treatment strategies across cognitive impairment categories could be beneficial.

Figure 1. Distribution of Cognitive Impairment Severity

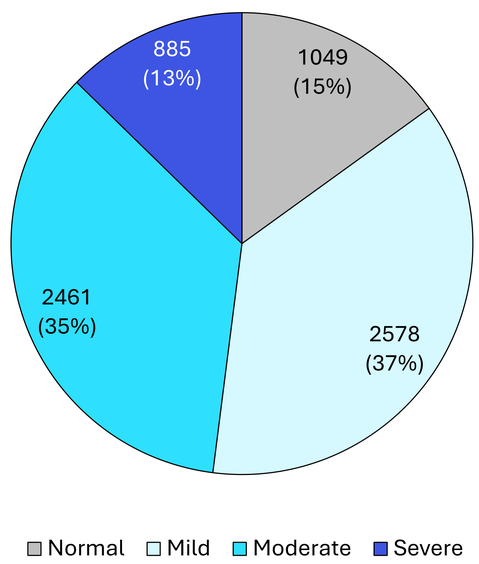
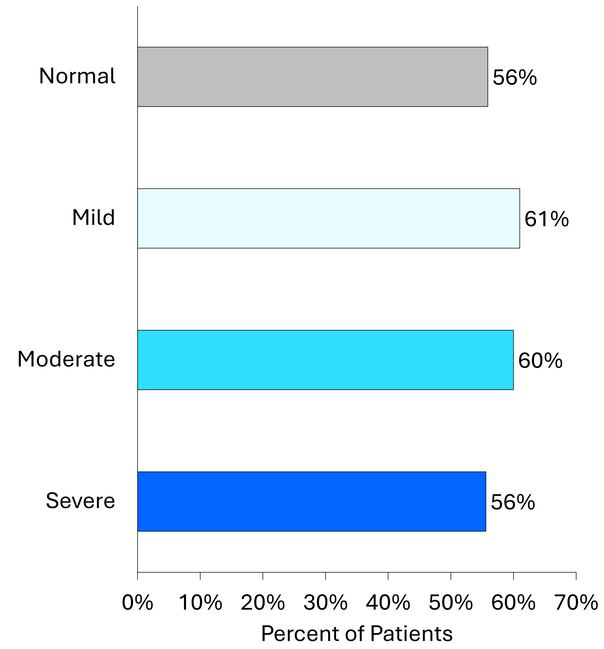


Figure 2. Cognitive Impairment Severity by Cholinesterase/NMDA treatment



NMDA = N-methyl-D aspartate

Table 1. Patient Demographics by Cognitive Impairment

Characteristic	Normal N = 1049	Mild N = 2578	Moderate N = 2461	Severe N = 885
Age in years, Mean (SD)	77.4 (7.2)	78.3 (7.1)	78.9 (6.8)	78 (7.6)
Gender, n (%)				
Female	531 (51%)	1555 (60%)	1581 (64%)	595 (67%)
Male	518 (49%)	1023 (40%)	880 (36%)	290 (33%)
Race, n (%)				
White	875 (85%)	2105 (83%)	1875 (78%)	636 (73%)
Nonwhite	155 (15%)	429 (17%)	527 (22%)	237 (27%)
Ethnicity, n (%)				
Hispanic or Latino	15 (3%)	58 (3%)	106 (5%)	49 (7%)
Not Hispanic or Latino	553 (97%)	1780 (97%)	1847 (95%)	681 (93%)

SD = standard deviation
Note: Percentages based on non-missing values.

Abbreviations: AD= Alzheimer's Disease; ICD-10 = International Classification of Diseases, 10th Revision; MMSE = Mini Mental State Exam; MoCA = Montreal Cognitive Assessment; NMDA = N-methyl-D aspartate; SD = standard deviation.

References: 1. Passeri, E., Elkhoury, K., Morsink, M., Broersen, K., Linder, M., Tamayol, A., Malaplate, C., Yen, F. T., & Arab-Tehrany, E. (2022). Alzheimer's Disease: Treatment Strategies and Their Limitations. *International journal of molecular sciences*, *23*(22), 13954. 2. Khan, S., Barve, K. H., & Kumar, M. S. (2020). Recent Advancements in Pathogenesis, Diagnostics and Treatment of Alzheimer's Disease. *Current neuropharmacology*, *18*(11), 1106–1125. 3. Cummings, J. L., Osse, A. M. L., Kinney, J. W., Cammann, D., & Chen, J. (2024). Alzheimer's Disease: Combination Therapies and Clinical Trials for Combination Therapy Development. *CNS drugs*, *38*(8), 613–624. https://doi.org/10.1007/s40263-024-01103-1

Contact Information
Amanda Althoff | Principal Data Scientist | **OMNY Health** | **Email:** amanda@omnyhealth.com

Presented at ISPOR 2025: May 13-16, 2025; Montreal, Quebec, Canada