Care Dependency and Sick Leave Patterns in Early Alzheimer's Disease: A Retrospective Claims Data Analysis in Germany

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Background

- Alzheimer's disease (AD) is a progressive neurodegenerative disorder that places a growing burden on patients, care partners and healthcare systems. Early AD (eAD), which includes mild cognitive impairment and mild dementia due to AD, is a key stage where timely intervention can help preserve independence and delay care needs (1, 2).
- As eAD progresses, individuals require support with daily activities, leading to care dependency and more sick leave. With dementia cases in Germany projected to rise from 1.8 to 2.8 million by 2055 (3), the pressure on the healthcare system is expected to intensify.
- Despite its impact, there is limited real-world evidence on care dependency and sick leave in eAD. Insights from statutory health insurance (SHI) data are essential for informing effective healthcare strategies.

Objective(s)

- This study uses SHI data from Germany to investigate care dependency levels and sick leave patterns in early stages of individuals with AD.

Methods

Study design

- A retrospective, non-interventional analysis was conducted using anonymized claims data from the German SHI system.
- Data source: InGef research database, comprising ~4 million individuals (~5% of the German population), drawn from a pool of 9 million insured individuals.
- The database is representative of the German population in terms of age, sex and geographical distribution. It provides an adequate representation of morbidity, mortality and drug utilization (4).

Study population

- Due to the absence of stage-specific ICD-10-GM codes for AD, patients with de-novo prescriptions of specific acetylcholinesterase (AChE) inhibitors (index event) approved for AD treatment were identified to assess the early stages of the disease. Pre-index (before first prescription) and post-index (after first prescription) cohorts were then formed based on this index event.
- Two cohorts were constructed: one ***pre-cohort*** to assess changes over time up to eight years before, and another ***post-cohort*** to assess changes over time up to five years after the index (see **Figure 1**).

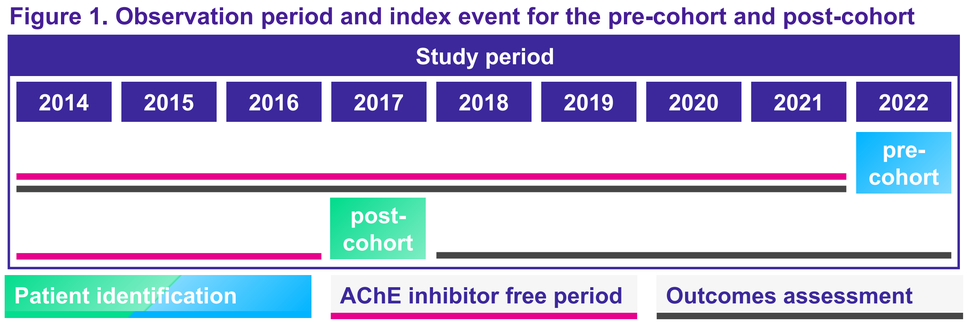
Pre-cohort (2022)

- Patients with de-novo prescriptions of AChE inhibitors donepezil (ATC: N06DA02), galantamine (ATC: N06DA04), or rivastigmine (ATC: N06DA03; Parkinson's disease exclusion by ICD-10-GM*) in 2022.
- No memantine (ATC: N06DX01) prescriptions from January 1, 2014 up to 100 days following the index date (to exclude patients likely in moderate-to-severe stages).
- Age ≥50 years as of December 31, 2022 and continuous insurance coverage from January 1, 2014 to December 31, 2022.
- The first documented prescription of an AChE inhibitor defined the index date and prescriptions were identified using ATC codes.

Post-cohort (2017)

- Patients with de-novo prescriptions of AChE inhibitors donepezil (ATC: N06DA02), galantamine (ATC: N06DA04), or rivastigmine (ATC: N06DA03; Parkinson's disease exclusion by ICD-10-GM*) in 2017.
- No memantine (ATC: N06DX01) prescriptions from January 1, 2014 up to 100 days following the index date (to exclude patients likely in moderate-to-severe stages).
- Age ≥50 years as of December 31, 2017 and continuous insurance coverage from January 1, 2014 to December 31, 2022.
- The first documented prescription of an AChE inhibitor defined the index date and prescriptions were identified using ATC codes.

Figure 1. Observation period and index event for the pre-cohort and post-cohort



Matching

- Each study population cohort was matched 1:1 to respective control cohorts without any signs of AD, based on demographic and clinical characteristics.

Study outcomes

- Care dependency
  - Assessed annually using German OPS codes that define levels of care by level 1: minor care needs, levels 2–3: moderate to severe care needs and levels 4–5: highest care needs
  - During the study period, a transition in coding from "care degree" to "care level" took place in the German healthcare system. The used OPS codes 9-984 covers all relevant codes for care.
- Sick leave
  - Evaluated based on documented sick leave episodes and associated ICD-10-GM diagnoses.

ICD-10-GM codes for exclusion of Parkinson's disease: G20.-, G21.-, G22, F02.3*

References

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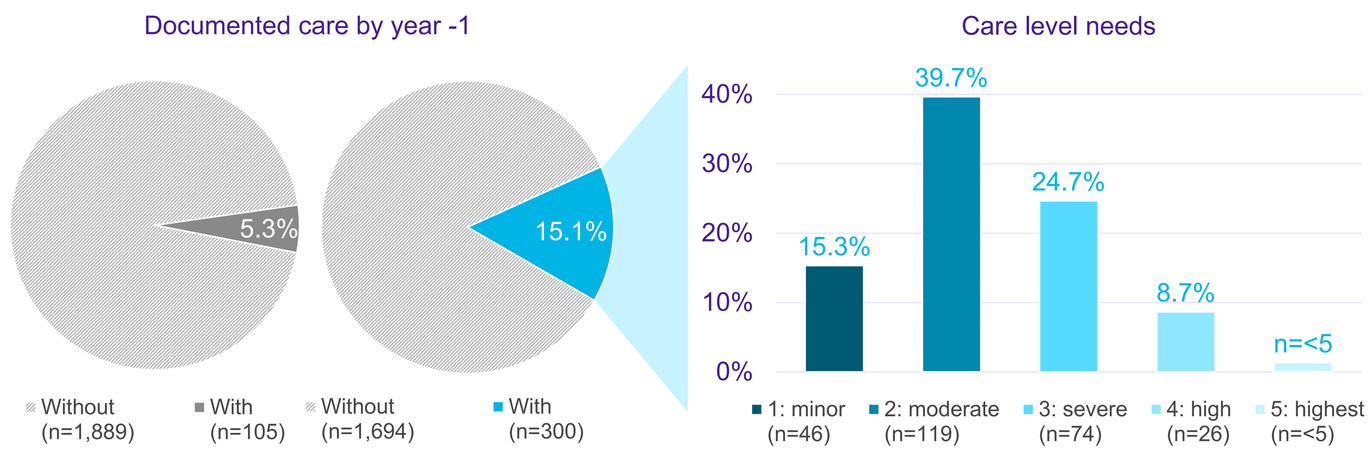
Results

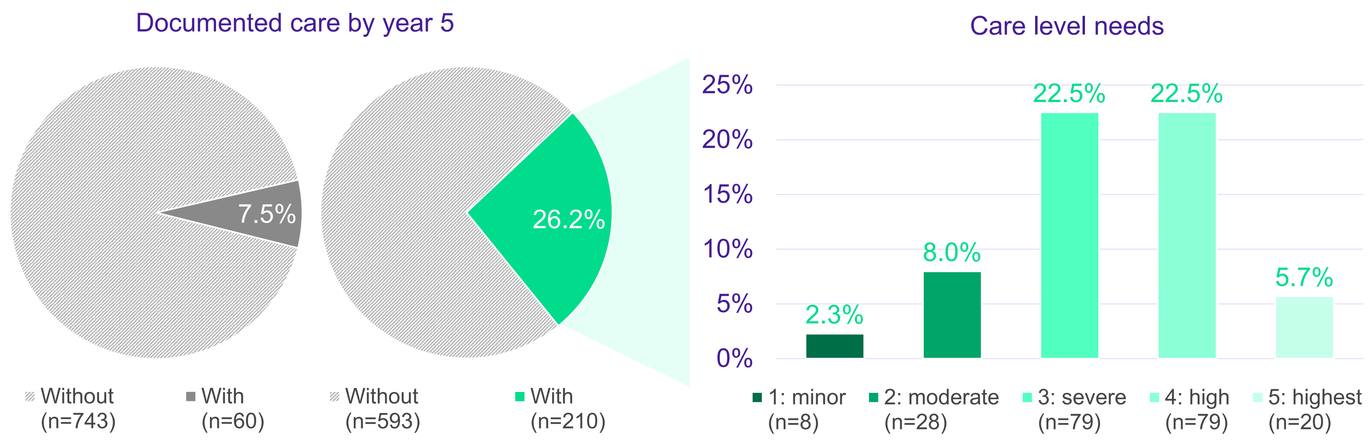
- After applying the patient selection criteria, ***1,997*** patients in the ***pre-cohort*** and ***2,051*** patients in the ***post-cohort*** were identified as having received a de-novo prescription of an AChE inhibitor. Corresponding control cohorts of ***1,997*** and ***2,051*** individuals, were identified.
- The mean age of the ***pre-cohort*** and ***matched controls*** was 80.1 years, and 56.5% of both cohorts were female.
- The mean age of the ***post-cohort*** and ***matched controls*** was 79.8 years, and 58.9% of both cohorts were female.

Figure 2. Proportion of patients with documented care by year -1 and the respective specific care needs of the pre-cohort



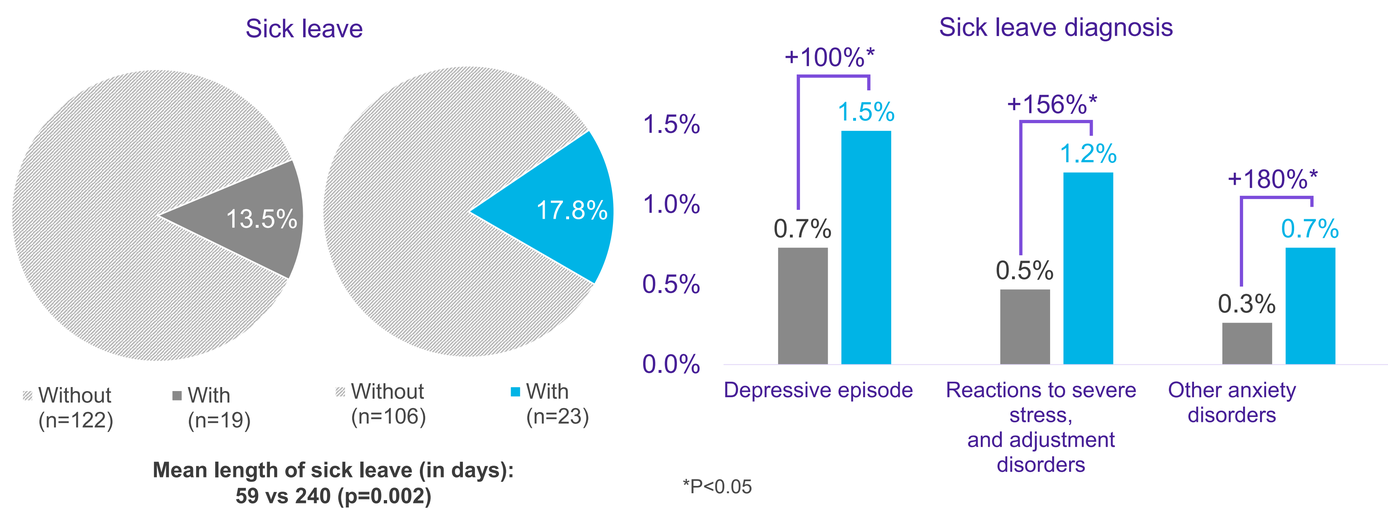
- In the pre-cohort, 15.1% of patients had documented care by year -1 (one year before index event), compared to 5.3% in the control group (p<0.001). In contrast, no care was documented in year -8 for either group (see **Figure 2**).
- Among those in the pre-cohort who received care in year -1, 15.3% were assigned to care level 1 (minor), 39.7% to level 2 (moderate), 24.7% to level 3 (severe), 8.7% to level 4 (high), and 1.3% to level 5 (highest) (see **Figure 2**).

Figure 3. Proportion of patients with documented care by year 5 and the respective specific care needs of the post-cohort



- In the post-cohort, care prevalence increased from 21.7% in year 1 to 26.2% in year 5. This significantly exceeded the rates observed in the control group (2.7% and 7.5% respectively; p<0.001 for both years) (see **Figure 3**). In year 1, most of the 2,051 patients in the post-cohort were assigned to care level 2 (moderate; 9.3%), but by year 5, there had been a shift towards higher care levels, with 9.8% of patients being assigned to levels 3 (severe) and 4 (high).
- Among the 210 patients (26.2%) with documented care by year 5, care levels were distributed as follows: 2.3% to level 1 (minor); 8.0% to level 2 (moderate); 22.5% to level 3 (severe); 22.5% to level 4 (high); and 5.7% to level 5 (the highest) (see **Figure 3**).

Figure 4. Proportion of patients with documented sick leave and respective sick leave diagnosis



- Sick leave rates were similar in year -8 between the pre-cohort and control groups (24.1% vs. 25.4%; p=0.701). By year -1, rates were higher in the pre-cohort group (17.8%) compared to controls (13.5%), though this difference was not statistically significant (p=0.324). However, the mean duration of sick leave differed significantly: patients in the pre-cohort averaged 240 days, compared to 59 days in the control group (p=0.002) (see **Figure 4**).
- The most common diagnoses associated with sick leave showed significant differences were depressive episodes, observed in 1.5% of patients versus 0.7% of controls (p=0.0298); reactions to severe stress and adjustment disorders, seen in 1.2% of patients compared to 0.5% of controls (p=0.0129); and other anxiety disorders, reported in 0.7% of patients versus 0.3% of controls (p=0.0385) (see **Figure 3**).

Conclusions

- This study demonstrates that care dependency is more prevalent in AD cohort, starting one year before first AChE prescription, with a clear progression in care needs over time.
- Sick leave patterns reveal significantly longer sick leave duration for patients later treated with AChE inhibitors, often associated with psychiatric comorbidities such as depression, stress-related disorders, and anxiety. These findings suggest that sick leave, particularly linked to mental health, may serve as an early indicator for underlying AD.
- High rate of care dependency in patients before first AChE prescription might reflect non-diagnosed AD condition in this population. Awareness and recognition of AD-related comorbidities, timely diagnosis, and intervention could delay the need for care and preserve independence, thereby reducing the burden on healthcare systems.

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