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Cognitive Status of Older Adults on Admission to a Skilled Nursing Facility According to a Hospital Discharge Diagnosis of Dementia

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Abstract

Objective—Describe the cognitive status on admission to a skilled nursing facility (SNF) according to a hospital discharge diagnosis of dementia in a national sample of Medicare beneficiaries.

Design—Retrospective cohort design.

Setting—SNFs in the United States

Participants—Medicare-fee-for-service beneficiaries newly admitted to a SNF within three days of discharge from an acute hospital during 2013–2014 (n=1,885,015).

Measurements—Beneficiaries with a discharge diagnosis of dementia were identified using ICD-9 CM codes from the Medicare Provider Analysis and Review (MedPAR) Part A file. Cognitive status at SNF admission was classified as cognitively intact, mildly impaired, moderately impaired, or severely impaired according to the Cognitive Function Scale using items in the Minimum Data Set 3.0.

Results—For beneficiaries with a discharge diagnosis of dementia (n=252,970), 17.9% were classified as cognitively intact, 25.8% were mildly impaired, and 56.3% were moderately or severely impaired on SNF admission. Approximately 65% of beneficiaries without a hospital

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diagnosis of dementia were cognitively intact on admission to a SNF, whereas 13.1% were classified as moderately or severely impaired.

Conclusion—Medicare beneficiaries with a hospital diagnosis of dementia are often classified as cognitively intact or mildly impaired on admission to a SNF. These findings provide evidence that a hospital diagnosis of dementia might not always reflect cognitive status on admission to a SNF.

Keywords

Skilled Nursing Facilities; Cognition; Dementia

Introduction

Older adults with dementia are frequently discharged to a skilled nursing facility (SNF) following an acute hospital stay¹. SNFs rely on hospitals to provide timely and accurate discharge information so that appropriate care plans can be developed. However, a patient's cognitive and functional status on admission to a SNF is often different than what was reported by hospital staff². This can lead to delays in care being provided and increased workloads for SNF staff².

Population-level analyses of Medicare beneficiaries' cognitive status on admission to a SNF have been limited by the lack of objective measures in the Minimum Data Set (MDS). In 2010, the Centers for Medicare and Medicaid Services introduced the MDS 3.0, which includes a performance-based cognitive measure^{3,4}. The purpose of this analysis was to describe the cognitive status on admission to a SNF according to a hospital discharge diagnosis of dementia in a national sample of Medicare beneficiaries.

Methods

This analysis used 100% National Medicare Part A and MDS 3.0 data for 2013–2014. The analytic sample included Medicare-fee-for-service beneficiaries aged 65 or older who were newly admitted to a SNF within 3 days of discharge from an acute hospital stay and who had at least a 5-day MDS assessment. Only the first SNF stay for each beneficiary was selected. Beneficiaries with a discharge diagnosis of stroke⁵ (n=95,442), delirium according to discharge diagnosis or the MDS 3.0 Confusion Assessment Method⁶ (n=99,848), or who were comatose (n=13) were excluded. The final sample included 1,885,015 beneficiaries.

Classification of dementia

Beneficiaries with one or more ICD-9-CM codes for dementia (331.0, 290.0, 290.40, 294.11, 294.20, 294.21, 294.8) were classified as having a hospital discharge diagnosis of dementia. The hospital diagnosis was compared to the active SNF dementia diagnosis in section I of the MDS 3.0.

Classification of cognitive function

SNF cognitive status was determined using the Cognitive Function Scale⁷. This is a validated measure that combines data from the Brief Interview for Mental Status^{3,4} (BIMS) and the Cognitive Performance Scale⁸ (CPS) into a single scale (Figure 1). The BIMS

assesses learning, recall, and orientation. Not all beneficiaries receive or complete the BIMS, in which case a CPS score is calculated using items from the MDS (cognitive skills for daily decision making, ability to make self understood, self-performance for eating, and comatose). Beneficiaries classified as cognitively intact, mildly or moderately impaired by the Cognitive Function scale are frequently able to complete the BIMS, whereas those unable to make themselves understood or unable to complete the BIMS require a CPS score to be calculated.

Additional measures

The MDS 3.0 was used to obtain information for mental disturbances (hallucinations, delusions, and psychosis), behavioral symptoms (verbal behavioral symptoms directed toward others, physical behavioral symptoms directed toward others, other behavioral symptoms, and rejecting care), and self-performance for activities of daily living (ADLs). Beneficiaries were classified as exhibiting zero, mild-moderate (1 – 4 points), and severe (5 – 12 points) aggressive symptoms⁹. Selfperformance for ADLs was summarized using a 28-point scale^{10,11}.

Statistical analysis

ANOVA and χ^2 -tests were used to examine differences in beneficiary characteristics according to a hospital diagnosis of dementia. Cohen's kappa (κ) statistic¹² was used to estimate the agreement between a hospital diagnosis of dementia and being classified as moderately or severely impaired at SNF admission. A Kolmogorov-Smirnov test was used to evaluate if the median SNF cognitive status differs by hospital dementia diagnosis. The probability for a hospital diagnosis of dementia according to SNF cognitive status was also calculated.

Results

A total of 252,970 beneficiaries (13.4%) were identified as having a hospital diagnosis of dementia. These beneficiaries were significantly older, were more likely to be male, to have mental symptoms, aggressive behaviors, ADL limitations, difficulties understanding others or being understood, and to have completed the CPS compared to beneficiaries with no hospital dementia diagnosis (Table 1). Approximately 92% of beneficiaries with a hospital dementia diagnosis also had an active SNF diagnosis for dementia compared to 12.9% of beneficiaries with no hospital dementia diagnosis.

Nearly 60% of all beneficiaries were classified as cognitively intact on admission to a SNF, 22% were mildly impaired, 15.4% were moderately impaired, and 3.4% were severely impaired. Among beneficiaries with a hospital diagnosis of dementia, 17.9% were classified as cognitively intact, 25.8% were mildly impaired, 45% were moderately impaired, and 11.3% were severely impaired. The majority (65.6%) of beneficiaries with no hospital diagnosis of dementia were classified as cognitively intact, 21.4% were mildly impaired, 10.9% were moderately impaired, and 2.2% were severely impaired.

The κ for a hospital dementia diagnosis versus being moderately or severely impaired on SNF testing was 0.37. The median SNF cognitive status for beneficiaries with a hospital

dementia diagnosis was moderately impaired and was cognitively intact for those with no dementia diagnosis ($p < 0.05$). The probability for a hospital diagnosis of dementia for beneficiaries classified as cognitively intact, mildly impaired, moderately impaired, and severely impaired, was 0.048 (95% CI=0.048–0.049), 0.141 (95% CI=0.140–0.142), 0.344 (95% CI=0.343–0.346), and 0.626 (95% CI=0.624–0.629), respectively.

Discussion

This analysis indicates that the majority of Medicare beneficiaries are observed to be cognitively intact on admission to a SNF, but beneficiaries with a hospital diagnosis are frequently cognitively intact or mildly impaired on admission to a SNF. Seventeen percent of beneficiaries with a hospital diagnosis of dementia were classified as cognitively intact based on SNF cognitive testing and 25.7% were classified as mildly impaired. The κ for agreement between a hospital dementia diagnosis and SNF cognitive status were within the range of what is considered minimal, or fair, agreement¹³. The probability for a hospital diagnosis of dementia increased with greater SNF cognitive impairment.

Medicare claims data are believed to be less likely to include mild cases of dementia¹⁴. However, initiatives promoting cognitive screening may contribute to dementia being diagnosed earlier when cognitive symptoms are less severe¹⁵. Continued research is needed to determine if physicians increased awareness to dementia symptoms may contribute to an overuse of a dementia diagnosis in a hospital setting. The cognitive function of older patients can be highly dynamic during an acute hospital stay and temporary causes of dementia-like symptoms (e.g., medication interaction, infection, vitamin deficiency) need to be considered before giving a diagnosis of dementia¹⁶.

Certain characteristics of the MDS 3.0 may have contributed to a discrepancy between a hospital discharge diagnosis of dementia and cognitive status on admission to a SNF. First, the MDS 3.0 does not screen for mild cognitive impairment (MCI) and some beneficiaries with a hospital diagnosis of dementia may actually have MCI. Second, the BIMS is a short cognitive screening tool that does not include items for executive function, language, or other less common patterns of cognitive impairment observed in dementia. Third, the MDS instructs the BIMS to be administered in optimized conditions, such as ensuring that testing is done in the appropriate language, using an interpreter if needed, ensuring that hearing deficits are addressed prior to assessment, and that the interview is conducted in a private setting.

The results of this analysis have several clinical implications. Older adults with dementia often require extensive SNF care¹⁷ and evaluating cognitive function in a SNF can facilitate improved patient care³. An accurate diagnosis of dementia, and hospital staff effectively communicating this diagnosis to SNF staff, is critical to the coordination of care². Proper documentation of a dementia diagnosis is also important to Accountable Care Organizations when defining and evaluating patient populations¹⁸.

Conclusions

Medicare beneficiaries with a hospital diagnosis of dementia are often observed to be cognitively intact or mildly impaired on admission to a SNF. These results suggest that a hospital diagnosis of dementia may not reflect a patient's cognitive status on admission to a SNF. Future research involving medical chart reviews can provide insight into the source of discordance. Continued research is also needed to determine if the degree of agreement varies across conditions commonly discharged to SNFs, such as joint replacement and heart failure¹⁹. Such investigations can provide additional insight into the clinical significance of the agreement between a hospital dementia diagnosis and SNF cognitive status.

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Figure 1. Creating the Cognitive Function Scale using the BIMS and CPS

Notes. BIMS = Brief Interview for Mental Status; CPS = Cognitive Performance Scale

Cognitively Intact: Having completed the BIMS and scoring between 13 and 15 points.

Mildly Impaired: A score of 8 – 12 points on the BIMS or a score of 0 – 2 points on the CPS.

Moderately Impaired: A score of 0 – 7 points on the BIMS or a score of 3 – 4 points on the CPS.

Severely Impaired: Not able to receive or complete the BIMS and a score of 5 – 6 points on the CPS.

Table 1

Characteristics of Beneficiaries According to a Hospital Diagnosis of Dementia

Characteristic	Total Sample (N=1,885,015)	Hospital Discharge Diagnosis of Dementia		P-value
		No Dementia (N=1,632,045)	Dementia (N=252,970)	
Age, mean (SD)	81.2 (8.3)	80.7 (8.4)	84.6 (7.2)	< 0.01
Gender				< 0.01
Male	657,727 (34.9)	572,691 (35.1)	85,036 (33.6)	
Female	1,227,288 (65.1)	1,059,354 (64.9)	167,934 (66.4)	
Mental Symptoms				< 0.01
Hallucinations	16,388 (0.9)	11,559 (0.7)	4,829 (1.9)	
Delusions	30,697 (1.6)	18,974 (1.2)	11,723 (4.6)	
Psychosis	40,268 (2.1)	26,137 (1.6)	14,131 (5.6)	
ADL function, mean (SD)	17.2 (4.6)	17.0 (4.5)	18.9 (4.5)	< 0.01
ADL score ≥ 23 points	135,197 (7.2)	99,132 (6.1)	36,065 (14.3)	< 0.01
Disruptive behaviors				< 0.01
None	1,724,603 (91.6)	1,519,897 (93.2)	204,706 (81.0)	
Mild-moderate	149,073 (7.9)	105,594 (6.5)	43,479 (17.2)	
Severe	9,650 (0.5)	5,093 (0.3)	4,557 (1.8)	
Cognitive measure completed				< 0.01
BIMS	1,713,247 (90.9)	1,507,423 (92.4)	205,824 (81.4)	
CPS	171,768 (9.1)	124,622 (7.6)	47,146 (18.6)	
Active SNF diagnosis of dementia	444,153 (23.6)	211,210 (12.9)	232,943 (92.1)	< 0.01
Cognitive status				< 0.01
Intact	1,115,720 (59.2)	1,070,374 (65.6)	45,346 (17.9)	
Mild impaired	414,813 (22.0)	349,490 (21.4)	65,323 (25.8)	
Moderate impaired	290,886 (15.4)	177,077 (10.9)	113,809 (45.0)	
Severely impaired	63,596 (3.4)	35,104 (2.2)	28,492 (11.3)	

Notes. Percentages based on column totals

ADL= Activities of Daily Living; BIMS = Brief Interview for Mental Status; CPS = Cognitive Performance Scale; SNF = Skilled Nursing Facility