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Original Study

Pain, Delirium, and Physical Function in Skilled Nursing Home Patients With Dementia

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A B S T R A C T

Objective: Skilled nursing facilities (SNFs) are major sites of postacute care for patients with dementia. A recent Office of the Inspector General report indicated that outcomes in SNFs are suboptimal because of poor-quality treatment, including the failure to provide needed care. Pain is frequently unrecognized and untreated in patients with dementia. The aim of this exploratory study was to examine the effect daily pain has on delirium and physical function in patients with dementia in SNFs. The association of daily pain with discharge disposition was also examined.
Design: Secondary analysis of data from an on-going randomized clinical trial.
Setting: Eight SNFs located in central and northeast Pennsylvania.
Participants: A total of 103 SNF patients with adjudicated dementia and delirium diagnoses and a mean age of 86 (±6.8) years; most were women (66%) and white (98%).
Measurements: Measures of pain (Pain Assessment in Advanced Dementia), delirium (Confusion Assessment Method), and physical function (Barthel Index) were taken daily for 30 days or until discharge.
Results: On days when participants experienced greater than their average level of pain, they also experienced more delirium symptoms ($P < .001$) and lower physical function ($P < .001$). Participants with higher levels of average daily pain were more likely to die (odds ratio [OR] 6.306, 95% confidence interval [CI] 1.914–20.771, $P = .003$) or be placed in a nursing home (OR 4.77, 95% CI 1.7–13.2, $P = .003$) compared with returning to the community at 3-month follow-up.
Conclusion: Greater attention to pain in patients with dementia may be a potential solution to some of the quality problems and high costs of care in SNFs.

Postacute care provided in skilled nursing facilities (SNFs) is designed to return patients to their highest level of functioning possible and reduce the high cost of disability after hospitalization. Despite Medicare expenditures that are second only to inpatient hospital care, a recent Office of the Inspector General (OIG) report indicated that outcomes in SNFs are often suboptimal because of poor-quality treatment, including the failure to provide needed care.[1] The report indicated that nearly one-third of Medicare beneficiaries who went to SNFs in 2011 for 35 days or less experienced harm events that were largely preventable.

Pain is common in older adults[2] and in dementia, where 50% experience regular pain.[3] Inadequate pain management can thwart rehabilitation efforts and dramatically increase costs by its harmful effects on mobility, cognition, healing, and mood.[4] In older adults with dementia, pain is frequently unrecognized and undertreated because of a number of complex factors, including inability of patients to verbally communicate the presence of pain[5] and a lack of clear guidance for health care providers on the best approach to treatment in different types of dementia.[3] Inappropriate pain medication was a major source of harm identified in the OIG report.

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Although not singled out in the OIG report, *inadequate* pain management is likely to harm individuals with dementia in SNFs, and it may contribute to their 40% increased risk for rehospitalization, as reported in the literature.[6]

Patients with dementia benefit from postacute care and can experience significant functional improvements over their admission status.[7] Less is known about how to optimize rehabilitation efforts in these individuals, although pain would be a logical target, because when untreated it sets in motion a cascade of negative outcomes. For example, surgical patients who reported greater pain at rest were found to be at higher risk for the development of delirium after controlling for preoperative delirium risk factors.[8] Dementia is the greatest risk factor for the development of delirium during hospitalization[9] and a substantial proportion of these patients are discharged to SNFs with unresolved delirium.[10] In a prospective cohort study, delirium superimposed on dementia on admission to these settings was a strong predictor of functional dependence, specifically walking recovery, at discharge and 1-year follow-up.[11] There is also a large body of literature that links pain to impaired physical function.[12] Worsening functional status during rehabilitation is an important risk factor for 30-day unplanned rehospitalizations,[13] the rate of which is more than 23% in SNFs.[14]

Pain management for individuals with dementia has received research attention, but there are few data to describe the impact of pain on daily function in the large number of those who receive postacute care services in SNFs. Most transitional care research has excluded individuals with dementia. Thus, the aim of this exploratory study was to examine the effect daily pain has on delirium and physical function in patients with dementia who receive rehabilitation services in SNFs. The association of daily pain to discharge disposition was also examined. Because pain is so variable from individual to individual, we were interested in how pain on a given day is related to delirium symptoms and physical function on that same day, and we conducted our analyses to capture this within-person perspective.

Methods

Data from an ongoing randomized clinical trial were used to address the aim of the study (ClinicalTrials.gov identifier: NCTO1267682). The investigators in that trial are testing the efficacy of cognitively stimulating activities for resolving delirium in persons with dementia during postacute care. The long-term goal of this work is to maximize rehabilitation so community-dwelling older adults can return to their homes following an acute care episode. The protocol received institutional review board approval and has been published.[15]

Setting and Sample

Participants are recruited and enrolled at the time of admission to 1 of 8 SNFs located in central and northeast Pennsylvania. The sites were selected to be reflective of SNFs in the United States: they are community-based and include a mix of profit and nonprofit facilities.

Eligible participants are those who are 65 years or older, community-dwelling before admission, have a knowledgeable informant, and have both dementia and delirium on admission to the SNF. The diagnosis of dementia is based on a score of 3 or higher on the Modified Blessed Dementia Rating Scale (MBDRS)[16]; and a Clinical Dementia Rating (CDR)[17] score ranging from 0.5 to 2.0, indicating mild- to moderate-stage dementia. The presence of delirium is established by screening potential participants using 2 instruments: (1) the Mini-Mental State Exam (MMSE),[18] a 30-item cognitive screen, and (2) the Confusion Assessment Method (CAM),[19] a standardized diagnostic algorithm for delirium. All dementia and delirium diagnoses are adjudicated by a panel of 3 experts in dementia: a neuropsychologist, a neurologist, and a geriatrician. Exclusion criteria include the following: having any neurological or neurosurgical disease associated with cognitive impairment other than dementia, including Parkinson disease with Lewy bodies, Huntington disease, normal-pressure hydrocephalus, seizure disorder, subdural hematoma, head trauma, or known structural brain abnormalities; nonverbal; having a life expectancy of 6 months or less; acute major depression or psychosis; and severe hearing and vision impairment.

Following written consent, participants are randomly assigned to 1 of 2 conditions: cognitive stimulation (intervention) or usual care (control). For this study, only participants assigned to usual care were included. These 103 participants had a mean age of 86 (±6.8) years, a Charlson Comorbidity Index[20] score of 2.79 (±1.6), and a CDR score of 1.21 (±0.6); 66% were women and 98% were white.

Procedure

Participants are assessed by trained research staff blind to treatment condition. Observational measures of pain, delirium, and physical function using the Pain Assessment in Advanced Dementia (PAIN-AD),[21] CAM, and Barthel Index (BI),[22] respectively, are taken daily for 30 days or until discharge. Three months after SNF admission, a phone interview with the responsible party is conducted to determine the participant's discharge disposition.

Measures

The CAM has 4 features: (1) acute onset and fluctuating course, (2) inattention, (3) disorganized thinking, and (4) altered level of consciousness. Scores range from 0 to 4. The CAM has been validated in persons with dementia, but because of the risk of feature overlap with dementia, only those with full (3 or more features) or subsyndromal delirium (2 features) are admitted to the study. The CAM has sensitivity between 94% and 100% and specificity between 90% and 95%.[19]

The BI is a commonly used ordinal scale for assessing activities of daily living in patients receiving inpatient rehabilitation. The BI has 10 items (7 for self-care and 3 for mobility) that are scored in steps of 5 points, with a total score range of zero (totally dependent) to 100 (fully independent). The BI is a reliable indicator of functional ability in older adults when administered by face-to-face interview (intraclass correlation coefficient [ICC] 0.89) and on testing by different observers (ICC 0.95–0.97).[22]

The PAIN-AD is an observational scale of 5 items (breathing, vocalization, facial expression, body language, and consolability). An observational rather than a verbal scale was used for greater reliability because delirium can interfere with verbal communication. PAIN-AD is scored from 0 to 10 and has an internal consistency reliability of 0.50 to 0.65 and interrater reliability of 0.82 to 0.97. A score of 1 to 3 indicates mild pain, 4 to 7 moderate pain, and 7 to 10 severe pain.[21]

Discharge disposition was determined in a 3-month follow-up phone interview with the responsible party and was classified as home or assisted living (community), nursing home, or death.

Analytic Strategy

Data in the current study were nested (days in persons and persons in facilities) and analyzed using multilevel models (MLMs). MLM (SAS software procedure mixed) allows for the examination of within-person relationships, that is, how pain on a given day is related to delirium symptoms on that same day within an