

The effects of cognitive impairment on nursing home residents' emergency department visits and hospitalizations

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Abstract

Background: Little is known about the relationship of cognitive impairment (CI) in nursing home (NH) residents and their use of emergency department (ED) and subsequent hospital services.

Methods: We analyzed 2006 Medicare claims and resident assessment data for 112,412 Medicare beneficiaries aged >65 years residing in US nursing facilities. We estimated the effect of resident characteristics and severity of CI on rates of total ED visits per year, then estimated the odds of hospitalization after ED evaluation.

Results: Mild CI predicted higher rates of ED visits relative to no CI, and ED visit rates decreased as severity of CI increased. In unadjusted models, mild CI and very severe CI predicted higher odds of hospitalization after ED evaluation; however, after adjusting for other factors, severity of CI was not significant.

Conclusions: Higher rates of ED visits among those with mild CI may represent a unique marker in the presentation of acute illness and warrant further investigation.

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Keywords:

Emergency department; Hospitalization; Nursing home; Cognitive impairment; Dementia; Transitions in care; Health-care utilization; Palliative care

1. Introduction

Nursing home (NH) residents represent a large and growing percentage of older adults visiting the emergency department (ED), with more than 2.2 million ED visits annually [1]. This vulnerable group has higher medical acuity and complexity than non-NH residents [1], with a threefold increased risk of acute respiratory or gastrointestinal infection after a visit to the ED [2]. The presence of cognitive impairment (CI) can significantly complicate the care of NH residents in the ED because of frequent mood and behav-

ioral difficulties, as well as inability to communicate symptoms and medical history [3–6]. Such complex patients commonly experience poor quality and fragmented care during transitions between care settings [7] and may do less well if sent to the hospital than if given treatment in the NH [5]. Moreover, care transitions in vulnerable groups often result in greater cognitive and functional decline, as well as iatrogenic complications such as incontinence, falls, infection, adverse drug events, and even death [8].

Thus, any care transition can place this population at higher risk for adverse outcomes and excess disability. Most studies to date have focused on hospitalizations of NH residents [9], but little is known about ED use that does not result in hospitalization, particularly among those with CI. Although some ED visits and hospitalizations are inevitable and appropriate, cognitively impaired NH residents are at higher risk for potentially preventable acute care transfers than those without CI [5,10–13]. Although a

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recent investigation found that the risk for such acute care transfers varies by the severity of CI [11], the study only examined whether any ED visit occurred and could not address the issue of repeated ED visits or the risk of hospitalization after ED evaluation.

No studies to date have specifically examined whether these vulnerable residents, when sent to the ED, are more commonly hospitalized or returned to the facility without hospital admission. Clinical characteristics, such as feeding tube (FT) use or heart failure, may impact a NH resident's risk of having an ED visit but not hospital admission. Like hospitalizations, frequent ED care transitions may set off a cascade of excess disability, reduce resident quality of life, and increase health-care costs. Addressing conditions related to ED use during an illness episode may reduce inappropriate ED and hospital service use and improve health outcomes. This analysis extends the existing literature by describing the severity of CI and other resident characteristics of a national random sample of NH residents. By using a two-stage analytical approach, we further estimate the effect of those characteristics and severity of CI on rates of total ED visits per year, then estimate the odds of hospitalization after being evaluated in the ED.

2. Methods

2.1. Study design and population

In this retrospective cohort study, we examined Medicare administrative claims and NH resident assessment data linked by beneficiary across the continuum of care. The study cohort consisted of a 5% national random sample of Medicare beneficiaries aged 65 years and older residing in US nursing facilities with a minimum data set (MDS) assessment between January 1 and December 31, 2006 ($n = 112,412$). The first available MDS assessment with complete MDS-Cognition Scale (MDS-COGS) data was used to select the study cohort. NH residents with health maintenance organization (HMO) insurance or hospice use were excluded. This study was approved by the University's Committee on Human Subjects.

2.2. Data sources

Medicare administrative claims and MDS resident assessment data were obtained from the Centers for Medicare and Medicaid Services Chronic Conditions Data Warehouse (CCW). CCW data are linked by a unique unidentifiable beneficiary key, which allows researchers to analyze information across the care continuum (<https://www.ccwdata.org/web/guest/about-ccw>). The 2006 Beneficiary Summary File, which contains beneficiary demographic and enrollment information, was linked by CCW to the 2006 MDS resident assessment data to identify a cohort of NH residents during the study year. The federally mandated MDS is a comprehensive resident assessment

completed within 2 weeks of admission to the facility, and then quarterly, annually, on readmission and when there is a significant change in the resident's status [14]. Beneficiaries identified in the aforementioned MDS file were matched to their inpatient and outpatient claims from the 2006 Medicare Provider Analysis & Review (MEDPAR) file and Outpatient Standard Analytic Files (SAFs), respectively.

2.3. Outcome measures

The three primary outcomes of interest were ED visits with hospitalization, ED visits without hospitalization, and total ED visits. The 2006 inpatient MEDPAR file was used to capture ED visits by NH residents that resulted in a hospitalization. If the ED charge amount variable in the MEDPAR was not zero, this indicated that there was an ED visit resulting in a hospital admission (classified as a "hospitalization"). Revenue center codes in the outpatient SAFs were used to capture NH residents who went to the ED but were not admitted to the hospital (classified as an "ED visit"). "Total ED visits" were defined as any ED visit with or without hospitalization. The number of hospitalizations, ED visits, and total ED visits were each summed as outcome measures. Outcomes were only counted after the MDS assessment was identified and then evaluated through death or the end of calendar year 2006, whichever came first, and adjusted for differential exposure time.

2.4. Primary predictor of interest—severity of CI

Severity of CI was defined using the MDS-COGS. This measure uses an 11-point summative rating of CI that ranges from 0 = cognitively intact to 10 = very severe impairment. The MDS-COGS is easier to compute and more sensitive for capturing levels of severity of CI than the Cognitive Performance Scale, another widely used MDS cognitive measure [15,16]. Dummy variables were used for each of the 11 points on the MDS-COGS scale.

2.5. Covariates

We controlled for several resident characteristics identified in the MDS, many of which have been used in previous studies examining predictors of acute care utilization by NH residents [3,5,9,11,17–19]. Categorical covariates included sociodemographic characteristics such as sex (male/female), race/ethnicity (white, black, or other), age group (65–75, 76–85, and 86+ years), and marital status (married or other). Additional resident categorical variables were included, such as specific diagnoses (e.g., diabetes, heart failure, emphysema/chronic obstructive pulmonary disease [COPD]), depression, history of a fall in the past 30 days, and level of activities of daily living (ADL) impairment. Resident treatments/preferences were

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