Pre-admission functional decline in hospitalized persons with dementia: The influence of family caregiver factors

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ABSTRACT

Older adults with dementia are more likely than those who do not have dementia to be hospitalized. Admission functional (ADL) performance is a salient factor predicting functional performance in older adults at discharge. The days preceding hospitalization are often associated with functional loss related to the acute illness. An understanding of functional changes during this transition will inform interventions to prevent functional decline. This secondary analysis examined data from a study that evaluated a family educational empowerment model and included 136 dyads (persons with dementia and their family caregiver). AMOS structural equation modeling examined the effects of family caregiver factors upon change in patient ADL performance (Barthel Index) from baseline (two week prior to hospitalization) to the time of admission, controlling for patient characteristics. Eighty-two percent of the patients had decline prior to admission. Baseline function, depression, and dementia severity, as well as Family caregiver strain, were significantly associated with change in pre-admission ADL performance and explained 40% of the variance. There was a good fit of the model to the data ($X^2 = 12.9$, $p = 0.305$, CFI = 0.97, TLI = 0.90, RMSEA = 0.05). Findings suggest the need for a function-focused approach when admitting patients with dementia to the hospital. FCG strain prior to hospitalization may be a factor impacting trajectory of functional changes in older person with dementia, especially in those with advanced dementia. FCG strain is an important assessment parameter in the risk assessment for functional decline, to be considered when engaging the FCG in the plan for functional recovery.

1. Introduction

An estimated 47.5 million persons worldwide have a diagnosis of dementia. Over the next 20 years, as the number of people older than 65 almost doubles and the number over 85 almost quadruples, the incidence, morbidity and mortality rates for dementia will increase dramatically (World Health Organization, 2017). The majority also suffer from one or more serious medical conditions such as coronary artery disease, diabetes, and chronic obstructive pulmonary disease (West, Cole, Goodkind, & Wan, 2014). These coexisting medical conditions as well as other potentially high-risk, acute issues (e.g., falls, infections, medication side effects, etc.) contribute to the high prevalence of hospital stays in this group (Alzheimer's Association, 2016). In the US, persons with dementia are two to three times more likely to be hospitalized than a person without dementia (Phelan, Borson, Grothaus, Balch, & Larson, 2012) and comprise 40% of all older hospital inpatients (Feng, Coots, Kaganova, & Wiener, 2014).

When hospitalized, persons with dementia experience greater incidence of functional decline, defined as a worsened functional status compared with a pre- admission level of 2 weeks before hospitalization (Covinsky et al., 2003; Palleschi et al., 2011). Acute functional decline is associated with longer hospital stays, protracted delirium, increased caregiver burden, unplanned readmission (Zekry, Herrmann & Grandjean, 2008) and transfers to a nursing home for long-term stay (Drame et al., 2012). Functional decline begins prior to admission in 30–50% of hospitalized older adults (Covinsky et al., 2003; Palleschi et al., 2014) and increases the risk to not return to baseline function (Boltz et al., 2015a,b; Covinsky et al., 2003).

Prehospital functional decline is presumed to be the effect of the acute disease on functional status in vulnerable patients. Vulnerabilities which have been found to be a significant predictor of prehospital decline include lower baseline functional status, advanced age, and the presence of dementia (Palleschi et al., 2014). Additionally, depression, which has been consistently associated with functional impairment in

cross-sectional and longitudinal epidemiologic and clinical studies is another vulnerability (Colon-Emeric, Whitson, Pavon, & Hoenig, 2013; Covinsky, Fortinsky, Palmer, Kresevic, & Landefeld, 1997; Lenze et al., 2005; Stuck et al., 1999).

1.1. Family role in supporting function

Prior to hospitalization, approximately 75% of hospitalized patients with Alzheimer's Disease-Related Dementias (ADRD) are living at home and receiving care from family members or friends (Brodaty & Donkin, 2009). These unpaid caregivers function as care providers or/and care managers. Care managers arrange for others to provide care whereas care providers provide hands-on care related to basic and instrumental activities of daily living, and illness- related activities such as coping with illness behaviors, and nursing and medical treatments (Schumacher, Beidler, Beeber, & Gambino, 2006). In community-residing older adults, family support that is commensurate with care needs in general, is associated with better functional status in patients with dementia (Tao, Ellenbecker, Chen, Zhan, & Dalton, 2012). Further, the nature of family engagement influences the functional status of the care recipient. In particular, efforts to support physical activity are associated with increased mobility in older adults during periods of acute illness (Boltz, Resnick, Capezuti, & Shuluk, 2014).

Stress related to caregiving affects the family member's ability to support the needs of the person with dementia (Rowe, Farias, & Boltz, 2016), including efforts to promote functional abilities (Tao et al., 2012). The acute illness of the person with dementia is marked by increased family stress (Boltz et al., 2015a,b; Shankar, Hirschman, Hanlon, & Naylor, 2014). The pre-existing, chronic strain borne by caregivers of persons with dementia is compounded by anxiety about the comfort and safety of the patient and the potential for increased care needs if hospitalized, at discharge (Boltz et al., 2015a,b; Shankar et al., 2014). These manifestations of stress may contribute to the functional decline that occurs prior to hospitalization in the person with dementia. Therefore, the purpose of this study was to examine the influence of family caregiver strain and anxiety upon pre-hospitalization functional decline in medical patients with dementia, controlling for patient characteristics. An understanding of these factors will help inform the needs of the patient upon admission to the hospital as well as family-centered interventions to promote functional recovery of persons with dementia.

We hypothesized that family caregiver strain and anxiety would be associated with decrements in physical function, baseline to admission to the hospital, in persons with dementia, while controlling for patient and family caregiver characteristics.

2. Methods

2.1. Design

This secondary analysis used baseline data from two comparative, repeated measures studies that evaluated the impact of a family educational empowerment model (Family-centered Function-focused Care; Fam-FFC), upon patient and family caregiver outcomes (Boltz et al., 2014, 2015b).

2.2. Sites and participants

The setting of the parent study was five medical units in two hospitals in the Northeast United States. The sample included dyads (N = 136) of older adults with dementia and their informal primary caregivers (FCGs). Patient eligibility included: age ≥ 65 and English-speaking/reading, a mini-cog score < 3 (Borson, Scanlan, Brush, Vitaliano, & Dokmak, 2000) and an AD8 ≥ 2. The AD8 contains 8 items that test for memory, orientation, judgment, and function, and has been validated as an informant-based interview used to screen for dementia

(Galvin et al., 2005, 2006). Patients who were terminally ill and/or receiving hospice care or had surgery were excluded.

Family members age 21 and above whose relatives meet inclusion criteria were eligible if they were: a) able to speak and read English; b) related to the patient by blood, marriage, adoption, or affinity as a significant other; and c) primary family caregivers who either lived with the patient or continued to provide caregiving from an alternate residence. The parent studies were approved by the Institutional Review Board (IRB) of the university, as well as the IRBs at the hospital sites.

2.3. Measures

2.3.1. Patient characteristics

Demographic information for patients included age, sex, race, education, marital status, and type of residence prior to hospitalization. Diagnoses were extracted from the medical record and comorbid conditions were classified with the Charlson Comorbidity Index, a weighted index that takes into account both the number and seriousness of different co-morbid diseases, considered a valid and reliable measure of disease burden (Van Doorn et al., 2001). Dementia severity was measured using the Blessed Dementia Scale, a 22-item, behavioral scale based on the interview of a close informant, evaluates changes in managing daily activities such as deterioration of faculties (misplacing, forgetting), loss of cognition for people, and loss of bodily and toilet function. The cognitive subscale omits the personality questions (12–22) and has a range from 0 (normal) to 17 (severely demented). The scale is correlated with neuropsychological test performance and differentiates patients with different degrees of dementia (Blessed, Tomlinson, & Roth, 1968).

The presence of delirium was evaluated using the Confusion Assessment Method (CAM). The CAM has high sensitivity and specificity; (Inouye et al., 1990; Pompei, Foreman, Cassel, Alessi, & Cox, 1995) validated in persons with dementia (Voyer, Cole, McCusker & Belzile, 2006). Delirium occurrence was evaluated as the presence of full or subsyndromal delirium, a binary outcome (present or absent), present upon admission. Depression was evaluated using the a Cornell Scale for Depression in Dementia, a 19-item survey designed to assess depressive symptoms in individuals with dementia which has demonstrated sufficient evidence of reliability and validity (Alexopoulos, Abrams, Young, & Shamoian, 1988; Korner et al., 2006).

Physical function at baseline (status two weeks prior to admission) and upon admission, using self or family caregiver report, was collected using the Barthel Index, a 14-item measure of the person's performance in activities of daily living (ADL; Mahoney & Barthel, 1965). There is sufficient evidence for the reliability and validity of the Barthel Index when used with older adults (Resnick & Daly, 1998)' and when proxy respondents were utilized to report the functional abilities of dementia patients (Ranhoff, 1997). Preadmission change in function was calculated by subtracting physical function upon admission from baseline physical function.

All patient measures were completed by a research evaluator upon admission, via observation, input from staff, chart abstracting or patient/family caregiver interview. Measures for FCGs were collected within 48 h of patient admission to the unit. These were collected via pen and paper questionnaires.

2.3.2. FCG demographic characteristics

Information included age, race, sex, education, marital status, work status, and role in the family (spouse, child, other).

2.3.3. FCG anxiety

Anxiety was evaluated with the seven-item Hospital Anxiety and Depression Scale (HADS) subscale for Anxiety (HADS-A). Scores can range from 0 to 21 with scores categorized as follows: normal (0–7), mild (8–10), moderate (11–14), severe (15–21) with established