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Geriatric assessment as predictors of hospital readmission in older adults with cancer☆

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ABSTRACT

Background: Hospital readmission is a common, costly problem. Little is known regarding risk factors for readmission in older adults with cancer. This study aims to identify factors associated with 30-day readmission in a cohort of older medical oncology patients.
Setting/Participants: Adults age 65 and over hospitalized to an Oncology Acute Care for Elders Unit at Barnes-Jewish Hospital.
Measurements: Standard geriatric screening tests were administered in routine clinical care. Clinical data and 30-day readmission status were obtained through medical record review.
Results: 677 patients met the inclusion criteria. 77% were white and 53% were male. Thoracic (32%), hematologic (20%), and gastrointestinal (18%) malignancies were most common. The 30-day unplanned readmission rate was 35.2%. Multivariable analyses identified complete dependence in feeding (odds ratio [OR], 3.70; 95% confidence interval [CI], 1.29–10.65), and some dependence (1.58, 1.04–2.41) and complete dependence (2.64, 1.70–4.12) in housekeeping, prior to admission, as associated with higher odds of readmission. Age < 75 (1.49, 1.04–2.14), African-American race (1.59, 1.06–2.39), potentially inappropriate medications (1.36, 0.94–1.99), and higher-risk reasons for index admission (1.93, 1.34–2.78) also increased odds of readmission. These factors were organized into a prognostic index.
Conclusion: Hospital readmission was common and higher than previously reported rates in general medical populations. We identified several previously unrecognized factors associated with increased risk for readmission, including some geriatric assessment parameters, and developed a practical tool that can be used by clinicians to assess risk of 30-day readmission.

1. Introduction

Hospital readmission is a common and costly problem, especially in older adults. From 2003–2004, the readmission rate among Medicare beneficiaries was 19.5%, with an estimated cost of $17.4 billion [1]. Hospitalization places older patients at risk for functional decline and institutionalization [2–4]. Furthermore, in 2012, the Centers for Medicare and Medicaid Services began reducing payments to hospitals with excessive readmission rates. A large proportion of readmissions are thought to be

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preventable [5]; therefore, reducing readmissions in older adult patient populations is a potentially high-impact strategy to preserve quality of life, improve quality of care, and reduce health care costs.

Among older adults hospitalized to general medical wards, previously identified risk factors for readmission include malnutrition, advancing age, comorbidities, depression, and African-American race [6–8]. However, readmission in medical oncology patients remains under-studied; one case-control study of 78 adults with cancer identified gastrointestinal cancer, nausea within 24 h of discharge, and caregiver difficulty as associated with readmission [9]. Risk factors for readmission in older adults with cancer have never been specifically investigated.

Geriatric assessment (GA) is a process of evaluating older adults for functional, psychosocial, or medical vulnerabilities, and developing a multidisciplinary treatment plan to optimize healthy aging. GA can improve outcomes related to survival, avoiding institutionalization, and preservation of functional status [10,11]. In older adults with cancer, geriatric assessment can predict chemotherapy toxicity [12–14] or early death [15]; however, whether GA predicts hospital readmission in older patients with cancer is unknown.

To investigate risk factors associated with readmission in a medical oncology population of adults over age 65, this study aims to determine whether a brief geriatric assessment predicts 30-day readmission in a cohort of older adults with cancer. We hypothesized that dependence in instrumental activities of daily living (IADLs) would predict 30-day unplanned readmission.

2. Methods

2.1. Study Design and Participants

A retrospective cohort study was conducted on patients age 65 and over who were admitted to an Oncology Acute Care for Elders (OACE) unit at Barnes-Jewish Hospital [16], a nonprofit teaching hospital affiliated with Washington University School of Medicine (St. Louis, MO), from 2000–2008. Acute Care for Elders units utilize interdisciplinary teams to address and improve outcomes for hospitalized older adults. Eligible patients had cancer or were within 1 year of receiving treatment for cancer. The index admission was defined as the earliest hospitalization during which the patient completed the geriatric assessment. Patients who died during the index hospital stay or within 30 days of discharge from the index hospital stay without a preceding readmission were excluded from the cohort.

2.2. Measures

As part of routine clinical care on the OACE unit, a brief geriatric assessment battery consisting of the Katz Index of Activities of Daily Living [17], the Lawton Instrumental Activities of Daily Living Scale [18], the Clock Completion Test [19], and the Short Blessed Test of Orientation, Memory, and Concentration [20] was administered to all patients age 65 and older. The Clock Completion Test is scored by assessing accurate placement of clock digits in quadrants of a pre-drawn circle. A score of 4 or greater out of a possible 7 points indicates cognitive impairment. The Short Blessed Test has a score range from 0 to 28, with scores of 9 or higher indicating cognitive impairment. The assessment was administered within 72 h of admission to the unit. Patients, or their caregivers if patients were unable to participate, were asked to use these scales to self-report their previous level of function (independent, somewhat dependent, or completely dependent), prior to the index admission. Because we hypothesized that some individual (instrumental) activities of daily living would be more predictive of readmission than others, the activities in the Katz and Lawton scales were analyzed individually rather than as a composite score. Comorbidity information was obtained at index admission by trained cancer registrars using the Adult Comorbidity Evaluation 27 [21]. We used the 2012 Beers Criteria for potentially inappropriate medication use in older adults [22] to determine if any discharge medications were potentially inappropriate for use in older adults.

2.3. Data Collection

Demographic and medical data were obtained through medical record review. Functional and cognitive assessment data were collected through review of OACE screening questionnaires. Information about patients' cancer type, stage, and treatment intent (curative or palliative) was ascertained through review of patients' oncology notes, pathology reports, radiographic data, and/or medical record review by one of the members of the study team (TW), a board-certified medical oncologist. Other clinical data included primary insurance, clinical diagnoses of dementia or depression, length of stay, patients' living situation prior to admission, discharge disposition, discharge services such as home health or hospice, and number of medications at admission and discharge. We also recorded hemoglobin and albumin levels within 48 h of discharge when those laboratory values were available.

The most urgent medical reason requiring hospital admission, or reason for admission (RFA), was ascertained through review of the index admission note, taking into account the patient's chief complaint, physical exam findings, laboratory and radiographic information, and admitting physician's assessment and plan. Reasons for admission were consolidated into broader system-based categories. For example, vomiting, dehydration, dysphagia, and diarrhea were classified as gastrointestinal reasons for admission. A taxonomy was iteratively developed to consistently assign RFAs to the correct category. Clinical judgment and consensus by two members of the study team were used to assign a reason for admission for cases that were ambiguous or multifactorial. Reasons for readmission were classified using the same taxonomy.

The primary endpoint, 30-day unplanned readmission, was defined as an unplanned admission to any hospital for any reason within 30 days of discharge from the index hospital stay. Elective or scheduled readmissions, such as for a planned procedure, were excluded from this definition. Evidence of readmission was ascertained from review of the

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