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Original Research—CME

Variation in Rehabilitation Treatment Patterns for Hip Fracture Treated With Arthroplasty

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Abstract

Background: Recommendations for health care redesign often advocate for comparative effectiveness research that is patient-centered. For patients who require rehabilitation services, a first step in this research process is to understand current practices for specific patient groups.
Objective: To document in detail the physical and occupational therapy treatment activities for inpatient hip fracture rehabilitation among 3 patient subgroups distinguished by their early rate of functional recovery between time of surgery to rehabilitation admission.
Design: Multicenter prospective observational cohort, practice-based evidence, study.
Setting: Seven skilled nursing facilities and 11 inpatient rehabilitation facilities across the United States.
Participants: A total of 226 patients with hip fractures treated with hip arthroplasty.
Methods: Comparisons of physical and occupational therapy treatment activities among 3 groups with different initial recovery trajectory (IRT) rates (slower, moderate, faster).
Main Outcome Measure(s): Percent of patients in each IRT group exposed to each physical and occupational therapy activity (exposure), and mean minutes per week for each activity (intensity).
Results: The number of patients exposed to different physical or occupational therapy activities varied within the entire sample. More specifically, among the 3 IRT groups, significant differences in exposure occurred for 44% of physical therapy activities and 39% of occupational therapy activities. More patients in the slower recovery group, IRT 1, received basic activities of daily living treatments and more patients in the faster recovery group, IRT 3, received advanced activities. The moderate recovery group, IRT 2, had some treatments similar to IRT 1 group and others similar to IRT 3 group.
Conclusions: Analyses of practice-based evidence on inpatient rehabilitation of hip fracture patients treated with arthroplasty identified differences in therapy activities among three patient groups classified by IRT rates. These results may enhance physiatrists', other physicians', and rehabilitation teams' understanding of inpatient rehabilitation for these patients and help design future comparative effectiveness research.

Introduction

The increasing prevalence of hip fracture necessitates research to identify optimal posthospitalization rehabilitation care [1,2]. Two main challenges facing researchers are clinical heterogeneity and practice variation. Patients themselves vary in their ages, comorbidity burden, functional abilities, and fitness levels, leading to considerable clinical heterogeneity. Research requires measures for grouping similar patients to identify which treatments are appropriate for which type of patient. Practice variation includes different rehabilitation settings with different types of programs after acute hospital care [3-8]. Different therapeutic interventions must be measured so that researchers and clinicians can test changes that might provide better outcomes.

Practice-based evidence—clinical practice improvement (PBE-CPI) is one comparative effectiveness research (CER) approach for studying rehabilitation care when clinical heterogeneity and practice variation exist [9]. PBE-CPI starts with collecting PBE data

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on a large group of patients distributed over different care sites. A range of patient types and current treatment practices are included. Patients' clinical heterogeneity is measured through detailed collection of their medical characteristics and illness severity [9-14]. Practice variation is assessed by the use of clinician-defined Point of Care (POC) forms that contain descriptions of all activities used by each rehabilitation discipline, including amount of time spent on each activity.

Detailed descriptions of therapy treatments can help define hip fracture rehabilitation in greater detail than has been available to date. The "baseline" of treatments is part of what some refer to as the "Black Box" of rehabilitation [13,15]. This term means the entire mixture of all interventions received by patients during inpatient rehabilitation from physicians, nurses, therapists, social workers, care managers, and other disciplines. When sample size is sufficiently large, at a minimum 350-400 patients per group, the detailed PBE-CPI database, including patient characteristics, treatment characteristics, and outcomes, can be used by physiatrists and other rehabilitation physicians, as team leaders, and rehabilitation teams in studies for hypothesis-generation and hypothesis-testing through: (1) CER and (2) clinical performance improvement.

Investigators from the Joint Replacement Outcome in Inpatient Rehabilitation Facilities and Nursing Treatment Sites (JOINTS) study used PBE-CPI methodology to investigate inpatient rehabilitation after hip and knee joint replacement [14]. These procedures were the fourth category of inpatient rehabilitation diagnoses to be studied using this methodology, after stroke, spinal cord injury, and traumatic brain injury [16-18]. Within the JOINTS patients with hip replacements was a patient subset with hip fractures.

An initial report on these hip fracture patients examined amounts of time for some of the physical therapy (PT) and occupational therapy (OT) activities [19]. Two groups of patients were compared on the basis of their site of care, either skilled nursing facility (SNF) or inpatient rehabilitation facility (IRF). Admission cognitive and motor Functional Independence Measure (FIM) scores differed. Generally, more minutes of each activity were provided in the IRF, compared with the SNF, setting.

The current study seeks to clarify rehabilitation treatments in greater detail by reporting all documented PT and OT activities; however, rather than comparing 2 groups of patients based on treatment site, similar patients are grouped based on their initial recovery trajectory (IRT) rate or score. In previous research, 3 groups of patients were identified by clustering statistically distinctive ranges of these scores: Group 1, slower; Group 2 moderate; Group 3 faster [20]. The IRT patient characteristic is defined as the change per day in functional status between end of surgery, when patients are assumed to have a minimal FIM score of 18, and admission to an inpatient rehabilitation setting. This applies the concept of FIM change per day that underlies FIM efficiency to individual patients' progress. In contrast, FIM efficiency typically is used to evaluate program outcomes. The IRT groups, at admission to rehabilitation, are analogous to other useful patient clinical classification systems with which physiatrists and other rehabilitation physicians are familiar, such as the New York Heart Association Functional Classification for heart failure and the preoperative American Society of Anaesthesiology physical status classification.

One advantage of the IRT measure for CER is its availability as a descriptor for grouping similar patients at admission to rehabilitation, analogous to the ASA rating before a surgery. In addition, IRT is an objective, patient-centered indicator of the initial recovery process. This rate of functional change alerts clinicians to patients' (1) medical status (getting better, worse, or staying the same) and (2) functional response to therapy. These functional changes, in turn, guide assessment of progress toward goals and treatment decisions.

The purposes for this paper were to: (1) examine the PT and OT components of rehabilitation for hip fracture patients through detailed description of all treatment activities and (2) test the hypothesis that treatments differ among the three groups of patients using the IRT classification.

Methods

Subjects

Subjects, N = 226, were patients with hip fractures drawn from the JOINTS study, a national, geographically diverse, multisite PBE-CPI study of inpatient rehabilitation after major joint replacement surgeries [14]. The study sites included self-selected voluntary SNF and IRF sites. Sites were encouraged to enroll as many consecutive patients with hip arthroplasty as possible, including both elective surgeries and hip fractures. Subject recruitment was stopped after the budgeted 13 months and a large sample, N = 979, of patients with hip replacement had been recruited. The current study includes the hip fracture subset, N = 226. The study was sponsored by a national provider organization.

Surgeries included were hip fracture treated with either hemiarthroplasty or total hip replacement surgery. Excluded were cases with open reduction internal fixation. Enrollment occurred February 2006 to February 2007. The study's observational cohort design and methods have been described previously by DeJong et al [13].