



Published in final edited form as:

Arch Phys Med Rehabil. 2009 April ; 90(4): 560–563. doi:10.1016/j.apmr.2008.10.021.

Disparities in Utilization of Outpatient Rehabilitative Care Following Hip Fracture Hospitalization With Respect to Race and Ethnicity

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Abstract

Objective—To compare the prevalence of discharge home to self-care after hip fracture hospitalization among the elderly in 3 racial groups: whites, Hispanics, and blacks.

Design—Secondary data analysis.

Setting—US hospitals.

Participants—Patients (N=34,203) aged 65 and older with Medicare insurance discharged after hip fracture hospitalization between 2001 and 2005.

Interventions—Not applicable.

Main Outcome Measure—Discharge home to self-care.

Results—Bivariate analyses showed higher rates of discharge home to self-care among minorities, 16.4% for Hispanics, 8.7% for blacks, and 5.9% for whites. Hispanics had 3-fold higher odds of being discharged home to self-care, and blacks had about 50% higher odds of being discharged home to self-care after adjusting for age, sex, Klabunde's comorbidity index, income, year of admission, type of hip fracture, surgical stabilization procedure, and length of hospital stay.

Conclusions—The higher rate of discharge home to self-care among minorities underscores the risk of suboptimal outpatient rehabilitative care among minorities with hip fracture.

Keywords

Aged; Hip Fractures; Medicare; Rehabilitation

More than 300,000 Patients fracture a hip every year,¹ and over 90% of hip fractures occur in patients aged 65 and older.² Hip fracture is associated with high morbidity, particularly the inability to walk. The Centers for Disease Control reports that about 50% of patients with hip

fracture never regain their former functionality.² Complications or poor recovery can lead to long- term loss of mobility and independence resulting in nursing home placement.

Rehabilitation is critical in restoring mobility, especially posthospital rehabilitation,^{3–7} which can take place in institutionalized care settings such as inpatient rehabilitation facilities and SNFs or in outpatient settings, which can include outpatient therapy and home health care.^{8–10} Among patients discharged home after hip fracture hospitalization, more than 90% need help with 1 or more ADLs including feeding, dressing, ambulation, toileting, bathing, transfer, continence, grooming and communication.¹¹ Kane et al¹² have shown that rehabilitation by home health care is associated with remarkable recovery in ADLs.

Minorities (Hispanics and non-Hispanic blacks) have a higher rate of discharge home after hip fracture hospitalization^{8,9} than non-Hispanic whites and may be more at risk of suboptimal recovery without optimal outpatient rehabilitative care because these same minorities are also reported to have lower access to outpatient care in general.^{13,14} The combination of discharge home and the lack of rehabilitation (which we term discharge home to self-care) may in fact constitute the mechanism of racial disparity in hip fracture. We hypothesized that minorities (Hispanics and non-Hispanic blacks) have higher rates of discharge home to self-care without outpatient rehabilitative care than non-Hispanic whites.

METHODS

To test this hypothesis, we compared the rates of discharge home to self-care (without outpatient rehabilitative care) among minorities (Hispanics and blacks) and non-Hispanic whites after hip fracture hospitalization by conducting a secondary data analysis of the 5% random sample of Medicare claims data from 2001 to 2005.

Data Sources

Data used in this study were derived from the Medicare claims data,¹⁵ a 5% random sample of patients with Medicare. This 5% random sample was derived from longitudinal claims of patients insured by Medicare insurance, which provides medical insurance coverage for about 97% of adults aged 65 and older in the United States.^{15,16} Claims from 2001 to 2005 represent the most current data available at the time of the study.

The data sample includes (1) Medicare Enrollment Database, a database of Medicare beneficiaries' demographic data including race/ethnicity, age, sex, receiving states assistance, and mailing zip code; (2) Medicare Provider Analysis and Review, Medicare hospital claims information regarding admission type (acute, postacute, and long term), up to 10 diagnoses (ICD-9 codes), procedure, date of procedure, length of hospital stay, and discharge disposition; and (3) Medicare Carrier files, outpatient Medicare claims from service providers that include information on outpatient visits with up to 5 diagnosis codes (ICD-9-Clinical Modification) per claim. The Medicare data are linked to Census 2000 to obtain socioeconomic data such as median income per zip code. Table 1 defines the variables selected for our analyses and provides the data source.

We included the first acute admission for closed hip fracture, closed transcervical fracture (ICD-9: 820.00, 820.02, 820.03, 820.09), closed pertrochanteric fracture (ICD-9: 820.20, 820.21, 820.22), or closed fracture of unspecified part of the neck (ICD-9: 820.8)¹⁷ from 2001 to 2005. After excluding patients without a valid discharge disposition and repeat admissions, 44,684 were identified. Of these, 10,481 were excluded; 954 were not Hispanic, non-Hispanic black or non-Hispanics white, and 9454 were not admitted from the community or did not survive to discharge. Our final sample consisted of 34,203 patients.

Variables

The independent variable was race/ethnicity (see table 1 for variables). The primary dependent variable was discharge home to self-care with no outpatient rehabilitative care (ie, patient had no arrangement for further rehabilitative care at the time of discharge home). Besides discharge home to self-care, Medicare hospital discharge settings include discharge home to home health care organization/outpatient therapy, discharge to inpatient rehabilitation, discharge to SNFs, discharge to nursing home, discharge to long-term care, or discharge to hospice.

Covariates included age, sex, Klabunde's comorbidity index,¹⁸ admitting diagnoses (type of fracture), stabilization procedure, length of hospital stay, zip code median income, and "receipt of state assistance" (see table 1). The Klabunde's comorbidity index is an adaptation of the Charlson's comorbidity index for use with administrative databases.¹⁸ The following comorbidities were used in the Klabunde's index: diabetes, chronic pulmonary disease, congestive heart failure, cerebrovascular disease, peripheral vascular disease, paralysis, acute myocardial infarction, old myocardial infarction, moderate or severe renal disease, ulcer disease, dementia, rheumatologic disease, liver diseases, and AIDS.¹⁸ The index was classified into none, 1, 2, or more than 2 in logistic regression analyses. "Receipt of state assistance" indicates persons with very low income who receive financial assistance from their state government to pay for Part B Medicare premium¹⁹ and includes persons with Medicaid.

Data Analyses

Descriptive and bivariate analyses were initially performed by using analysis of variance and chi-squared tests. Multiple logistic regression was used to examine the association between race/ethnicity and discharge home to self-care. Hosmer and Lemeshow goodness-of-fit tests were conducted to assess the fit of the logistic regression models. A *P* value less than .05 was considered significant. All analyses were conducted by using SAS version 9.0.^a The study was approved by the institutional review board.

RESULTS

We studied 34,203 patients discharged after hip fracture hospitalization between 2001 and 2005. Most (75.8%) were women, and the average age was 83 years (range, 66–108). The cohort included approximately 95.3% non-Hispanic whites, 3.5% non-Hispanic blacks, and 1.3% Hispanics (table 2). Hispanics and non-Hispanic blacks were more likely than non-Hispanic whites to be male (*P*=.02). Among all patients, 12% were discharged home; however, more Hispanics (28.8%) and non-Hispanic blacks (17.2%) were discharged home than non-Hispanic whites (11.6%). Among all patients discharged home, 52% were discharged home to self-care (see table 2). In addition, more Hispanics (16.4%) and non-Hispanic blacks (8.7%) were discharged home to self-care than non-Hispanic whites (5.9%).

Next, we examined the association between race/ethnicity and discharge home to self-care and found a significant association between race/ethnicity and discharge home to self-care. Hispanics had about 3-fold higher odds of being discharged home to self-care than the odds in non-Hispanic whites (OR=3.1; 95% CI, 2.4–4.1) in bivariate analysis. This higher odds of being discharged home to self-care among Hispanics persisted in logistic regression adjusting for age, sex, year of admission, type of fracture, procedure, income, state assistance, hospital length of stay, and Klabunde's index (OR=3.2; 95% CI, 2.1–4.8).

Non-Hispanic blacks had 50% higher odds of discharge home to self-care than did non-Hispanic whites. In logistic regression, the OR was 1.5 and 95% CI, 1.2 to 2.9 in univariate

^aSAS Inc, 100 SAS Campus Dr, Cary, NC 27513.

analysis, and the OR was equal to 1.4 and the 95% CI was 1.0 to 2.0 in multivariate analysis adjusting for age, sex, year of admission, type of fracture, procedure, income, state assistance, hospital length of stay, and Klabunde's index.

DISCUSSION

We observed higher rates of discharge home to self-care among Hispanics and blacks than the rate among whites. The higher rate of discharge home to self-care persisted after adjusting for covariates. This difference was not caused by a lower rate of receiving outpatient rehabilitative care (either home health care or outpatient therapy) among patients discharged home but rather higher rates of discharge home among minorities. The higher rate of discharge home without outpatient rehabilitation is troubling, given the critical role of posthospital rehabilitation in functional recovery among patients discharged home. Kane et al¹² showed much higher ADLs recovery among patients discharged home with rehabilitation than patients discharged home without rehabilitation.

One explanation for the higher rate of discharge home among minorities may be the different family structures and cultural perceptions of minorities from whites. Minorities (Hispanics and blacks) tend to have larger families with more children to serve as caregivers for older patients recovering from illnesses.¹³ Also, minorities report less favorable perceptions of alternative discharge settings such as nursing facilities than do family members of white patients.¹³ Although we had no information on functional status among minorities at discharge, given the high level of ADLs dependency at the time of discharge in patients with hip fracture^{11,12} and the suboptimal functional recovery among patients discharged home without rehabilitative care,¹² the high rate of discharge home to self-care among Hispanics and non-Hispanic blacks suggests suboptimal conditions for functional recovery. Further studies are needed to address this concern. In particular, studies examining outcomes in minorities discharged home with and without rehabilitative care will provide data useful in designing policies to ensure their optimal functional recovery.

Known barriers to improving outpatient care among minorities include language or cultural barriers in seeking care (among Hispanics) and a lack of transportation.¹⁴ Other contributors may include low income and a lack of adequate understanding of the critical role of rehabilitation. These barriers are likely to limit efforts to increase outpatient care for minorities, whereas enhanced rehabilitative care is necessary to optimize functional recovery among these minorities after discharge home from hip fracture hospitalization.

Providing optimal outpatient rehabilitative care among minorities not only will facilitate their recovery but will also provide a model for future rehabilitative programs for patients with other chronic conditions.

Advantages and Limitations of the Analysis

Using Medicare claims data for analyses allows access to a large dataset that permits for adjustment for multiple covariates and reflects both current trends in health care utilization among older Americans and the present ethnic diversity of the US population. Limitations of the dataset include possible coding errors associated with use of ICD-9 coding, although ICD-9 coding for hip fracture has been shown to be reliable.^{20,21} The low number of Hispanics and non-Hispanic blacks in our sample may have underpowered some analyses in this study. Fewer Hispanics may be qualified for Medicare because of a lack of adequate documentation of work history and the lower average age among Hispanics in the US. In addition, a relatively low sensitivity in the identification of Hispanics and non-Hispanic blacks using the race/ethnicity variable in the Medicare dataset may be a factor. However, Arday, et al²² reported improved sensitivity in race/ethnicity coding in recent years. Additional limitations for this study include

those associated with cross-sectional and retrospective studies and the inability to compare other factors impacting discharge. Overall, the percent of minorities identified in our study is consistent with that identified by previous studies.^{21,22}

CONCLUSIONS

Our findings suggest higher rates of discharge home without rehabilitative care among Hispanics and blacks (than whites) after hip fracture hospitalization and represent an opportunity to improve health care for minorities with hip fracture.

Acknowledgments

Supported by the Building Interdisciplinary Research in Women's Health Program (grant no. K12HD052023); the National Institute of Allergy and Infectious Diseases; the National Institute of Child Health and Human Development; the Office of the Director, National Institute of Health; the Agency for Healthcare Research and Quality, Health Services Research in Under-Served Populations (grant no. R24 HS011618); National Institute on Aging, National Institutes of Health (grant no. K02 AG019736); and the National Institute of Drug Abuse (grant no. K01DA021814).

List of Abbreviations

ADLs, activities of daily living; CI, confidence interval; ICD-9, *International Classification of Diseases, 9th Revision*; OR, odds ratio; SNFs, skilled nursing facilities.

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Table 1

Variable Sources and Definitions

Variable	Data Source	Definition
Independent variable		
Race/ethnicity	Medicare EDB	Non-Hispanic white, black, and Hispanic
Covariates		
Age	Medicare EDB	Age at diagnosis (in 4 age groups)
Sex	Medicare EDB	Men/women
Receipt of state assistance	Medicare EDB	Medicare part B paid for by state
Income	Census 2000	Quartiles
Comorbidity (during the prior year for persons admitted 2002–2005)	All Medicare files	Modified Charlson’s score
Type of fractures	MEDPAR	Admitting diagnoses (ICD-9 codes)
Year of admission	MEDPAR	Derived from date of admission
Surgical procedure	MEDPAR	Internal fixation, arthroplasty, or none
Length of stay	MEDPAR	From admission to discharge from the hospitals
Dependent variable		
Discharge home to self-care versus others	MEDPAR	Discharge home to self-care versus discharged home health care organization or outpatient therapy or continued institutional care (inpatient rehabilitation, SNF, NH, long-term care, and hospice)

Abbreviations: EDB, Medicare enrollment database; MEDPAR, Medicare provider analysis and review; NH, nursing home.

Table 2

Demographic and Discharge Data by Race/Ethnicity

Characteristics	Hispanics (n=438)	Blacks (n=1190)	White (n=32,575)	Total (n=34,203)
Age (mean ± SD in years) *	82.3±6.4	83.1±8.5	83.0±7.2	82.9±7.3
Women †	73.1	73.3	76.0	75.8
Receiving state assistance †	45.2	59.4	13.8	15.5
Median income (mean ± SD in dollars) *	32,159±14,085	33,286±12,416	43,727±16,408	43,224±16,417
Klabunde's index †				
None	46.4	45.7	51.0	50.8
1	25.9	23.2	26.2	26.2
2	14.7	15.9	12.8	12.9
>3	13.0	15.2	10.1	10.2
Diagnoses †				
Transcervical fracture (820.0×)	21.6	17.4	20.3	20.3
Petrochanteric fracture (820.2×)	30.9	45.7	34.9	34.9
Unspecified fracture (820.8)	47.5	37.0	44.9	44.9
Procedure performed †				
Arthroplasty	32.2	38.0	36.3	36.3
Internal fixation	61.0	51.4	57.5	57.3
No procedure	6.9	10.6	6.2	6.4
Length of stay (mean ± SD in days) *	7.3±5.5	7.5±7.1	6.4±4.4	6.4±4.5
Discharge †				
Home to self care	16.4	8.7	5.9	6.2
Home to home health or outpatient therapy	12.3	8.5	5.7	5.8
Inpatient rehabilitation facilities	24.4	25.1	23.4	23.5
SNFs	42.2	52.4	60.7	60.1
Others	4.3	5.3	4.3	4.4

NOTE. Cells are in percent unless otherwise specified.

* Indicates $P < .05$ by nonparametric comparisons (Kruskal-Wallis test).

† Indicates $P < .05$ by chi-square.