The Association of Frailty with Discharge Disposition for Hospitalized Community Dwelling Elderly Patients

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Frailty is a common geriatric syndrome characterized by decreased physiological reserves leading to increased vulnerability to stressors.[1] Frail individuals are at increased risk of adverse health outcomes including falls, disability, hospitalization, and mortality.[1] Discharge to skilled nursing facilities (SNFs) is also associated with adverse outcomes,[2,3] but limited data exist on the utility of frailty in predicting discharge location in medical elders. We aimed to evaluate the association of frailty assessed by the Reported Edmonton Frailty Scale (REFS) with discharge disposition in hospitalized medical patients who were previously living in the community.

METHODS

We conducted a prospective study of community dwelling elders (≥65 years) hospitalized to the medical service from January 2014 to April 2016. Trained research assistants interviewed patients and/or caregivers on hospital day 1; the REFS was used to screen for frailty and the Mini-Cog assessment for cognitive impairment (supplementary Appendixes 1 and 2). The primary outcome was discharge disposition categorized as discharge to home (with or without home health services) or discharge to a postacute care (PAC) facility (SNF or inpatient rehabilitation). Multivariable Poisson regression analysis was used to estimate the relative risk of discharge to a PAC facility. Frailty was grouped into the following 3 categories: (1) not frail, (2) apparently vulnerable/mildly frail, and (3) moderately/severely frail.

RESULTS

Among the 775 patients screened, 272 declined to participate, were non-English speakers, were transferred from another facility, were admitted under observation status, had advanced dementia, or died during hospitalization. Five hundred and three medical patients were included: median age was 80 years (interquartile range 75-86 years); 54.1% were female and 82.9% were white. The most common comorbidities were hypertension (51.7%), diabetes (26.0%), and renal failure (26.0%). Of the included patients, 11.1% had a known diagnosis of dementia and 52.1% screened positive for cognitive impairment (Table).

Overall, 24.9% were not frail, 49.5% were apparently vulnerable/mildly frail, and 25.6% were moderately/severely frail. About two-thirds (64.8%) returned home (40.0% with home healthcare) and 35% were discharged to a PAC facility (97.1% of them to SNF). Compared with patients who were discharged home, those discharged to a PAC facility were older (≥85 years; 26.7% vs 40.1%) and more likely to have dementia (7.7% vs 17.5%) and be frail (apparently vulnerable/mild frailty = 48.5% vs 51.4%%, moderate/severe frailty = 19.9% vs 36.2%; $P < .001$). Median length of hospital stay was shorter in those returning home (4 vs 5 days, $P < .001$).

In the multivariate analysis, which was adjusted for demographics, comorbidities, and principal diagnosis, frailty was strongly associated with discharge to PAC facility (apparently vulnerable/mild frailty vs no frailty, relative ratio [RR] = 2.00; 95% confidence interval [CI], 1.28-3.27, and moderate/severe frailty vs no frailty; RR = 2.66, 95% CI, 1.67-4.43). When the frailty score was included as a continuous variable, 1 unit increase in the score was associated with a 12% higher risk for discharge to a PAC facility (RR = 1.12; 95% CI, 1.07-1.17).

DISCUSSION

In this analysis of over 500 community-dwelling elderly medical patients hospitalized at one large tertiary center, we found that almost half of the patients were frail and over one-third had a new discharge to a PAC facility. Frailty, as assessed by REFS, was strongly associated with discharge to a PAC facility after adjusting for possible confounders.

Frailty is increasingly recognized as a useful tool to risk stratify the highly heterogeneous population of elderly people.[4] Previous studies reported that frailty was predictive of discharge to PAC facilities in geriatric trauma and burn injury patients.[5,6] We found similar results in a population of elderly medical patients. A recent study showed that the Hospital Admission Risk Profile score comprising of age, modified Mini-Mental State Examination (MMSE), and functionality prior to admission was

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TABLE. **Characteristics of the Study Population Overall and by Discharge Disposition**

Characteristic	Total Cohort n = 503	Home N = 326	Postacute care facility n = 177	*P* value
Age category, n (%)				<.001
65-74	109 (21.7)	87 (26.7)	22 (12.4)	
75-84	236 (46.9)	152 (46.6)	84 (47.5)	
≥85	158 (31.4)	87 (26.7)	71 (40.1)	
Female, n (%)	272 (54.1)	173 (53.1)	99 (55.9)	.54
White race, n (%)	417 (82.9)	266 (81.6)	151 (85.3)	.66
Insurance, n (%)				.14
Medicare	366 (72.8)	234 (71.8)	132 (74.6)	
Other[a]	137 (27.2)	92 (28.2)	45 (25.4)	
Principal diagnosis, n (%)				.08
Cardiac	94 (18.7)	61 (18.1)	33 (18.6)	
Gastrointestinal	74 (14.7)	54 (16.6)	20 (11.3)	
Infection	111 (22.1)	69 (21.2)	42 (23.7)	
Pulmonary	103 (20.5)	73 (22.4)	30 (16.9)	
Renal	27 (5.4)	14 (4.3)	13 (7.3)	
Hematological	26 (5.2)	19 (5.8)	7 (4.0)	
Other	68 (13.5)	36 (11.0)	32 (18.1)	
Gagne comorbidity score, median (IQR)	1 (0-4)	1 (0-4)	2 (0-5)	.21
Comorbidities, n (%)				
Dementia	56 (11.1)	25 (7.7)	31 (17.5)	.003
Congestive heart failure	92 (18.3)	54 (16.6)	38 (21.5)	.17
Hypertension	260 (51.7)	171 (52.5)	89 (50.3)	.64
Diabetes	131 (26.0)	89 (27.3)	42 (23.7)	.38
Renal failure	131 (26.0)	85 (26.1)	46 (26.0)	.98
Fluid/Electrolytes disorders	126 (25.0)	72 (22.1)	54 (30.5)	.37
Depression	68 (13.5)	37 (11.3)	31 (17.5)	.05
Mini-Cog <3, n (%)	262 (52.1)	147 (45.1)	115 (65.0)	<.001
Frailty category[b], n (%)				<.001
Not frail	125 (24.9)	103 (31.6)	22 (12.4)	
Apparently vulnerable/mildly frail	249 (49.5)	158 (48.5)	91 (51.4)	
Moderately/severely frail	129 (25.6)	65 (19.9)	64 (36.2)	
Total Edmonton score, median (IQR)	7 (6-10)	7 (5-9)	9 (7-10)	<.001
Length of stay, median (IQR)	4 (3,6)	4 (2,5)	5 (3,8)	<.001

[a]Other insurance: Medicaid, Private.
[b]Frailty category as assessed by Reported Edmonton Frail Scale with scoring: not frail: 0-5, apparently vulnerable: 6-7, mildly frail: 8-9 moderately frail: 10-11, or severely frail: 12-18.
Note: Abbreviation: IQR, interquartile range.

associated with discharge disposition in elderly patients admitted to a single geriatric unit in a rural hospital.[7] Our study supports this finding by using a validated measure of frailty, the RFS, and does not include the lengthy MMSE.

Our study has several limitations. First, it a single-center study and results may not be generalizable; however, we included a large sample of patients with a variety of medical diagnoses. Second, the REFS is self-reported posing the risks of recall, respondent bias, and interview bias. We chose the REFS to assess frailty due to its practicality and ease of administration but also its completeness of assessing multiple important geriatric domains. Lastly, we did not collect the reason for discharge to PAC and it may have been a potential confounder.

In conclusion, our study demonstrates that frailty assessed by a practical validated scale, the REFS, is a strong predictor of a new discharge to PAC facilities in older medical patients. Accurate identification of elders at risk for discharge to PAC facilities provides the potential to counsel patients and families and plan for complex post discharge needs. Future studies should identify potential interventions targeting frail patients in which PAC is not obligatory, aiming to increase their chance of being discharged home.

Disclosure: Drs. Stefan and Ramdass had full access to all the data in the study. They take responsibility for the integrity of the data and the accuracy of the analysis. Drs. Stefan, Starr, Brennan, and Ramdass conceived the study. Ms. Liu and Dr. Pekow analyzed the data. Dr. Ramdass prepared the manuscript. Drs. Stefan, Brennan, Lindenauer, and Starr critically reviewed the manuscript for important intellectual content. A subset of the patients included in this study was part of a Health Resources and Services Administration funded Geri-Pal Transformation through Learning and Collaboration project awarded to Baystate Medical Center, grant number U1QHP28702 (PI: Maura J. Brennan). The investigators retained full independence in the conduct of this research. The authors have no conflicts of interest.

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