JAMDA xxx (2015) 1–5

JAMDA

journal homepage: www.jamda.com

Original Study

Geriatric Screening Tools to Select Older Adults Susceptible for Direct Transfer From the Emergency Department to Subacute Intermediate-Care Hospitalization

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Keywords:
Comprehensive geriatric assessment
intermediate care
crisis management
potentially avoidable hospitalizations
emergency department
skilled nursing facilities

A B S T R A C T

Objectives: Early transfer to intermediate-care hospitals, low-tech but with geriatric expertise, represents an alternative to conventional acute hospitalization for selected older adults visiting emergency departments (EDs). We evaluated if simple screening tools predict discharge destination in patients included in this pathway.
Design, Setting, and Participants: Cohort study, including patients transferred from ED to the intermediate-care hospital Parc Sanitari Pere Virgili, Barcelona, during 14 months (2012–2013) for exacerbated chronic diseases.
Measurements: At admission, we collected demographics, comprehensive geriatric assessment, and 3 screening tools (Identification of Seniors at Risk [ISAR], SilverCode, and Walter indicator).
Outcome: Discharge destination different from usual living situation (combined death and transfer to acute hospitals or long-term nursing care) versus return to previous situation (home or nursing home).
Results: Of 265 patients (mean age ± SD = 85.3 ± 7.5, 69% women, 58% with acute respiratory infections, 38% with dementia), 80.8% returned to previous living situation after 14.1 ± 6.5 days (mean ± SD). In multivariable Cox proportional hazard models, ISAR >3 points (hazard ratio [HR] 2.06, 95% confidence interval [95% CI] 1.16–3.66) and >1 pressure ulcers (HR 2.09, 95% CI 1.11–3.93), but also continuous ISAR, and, in subanalyses, Walter indicator, increased the risk of negative outcomes. Using ROC curves, ISAR showed the best prediction among other variables, although predictive value was poor (AUC = 0.62 (0.53–0.71) for ISAR >3 and AUC = 0.65 (0.57–0.74) for continuous ISAR). ISAR and SilverCode showed fair prediction of acute hospital readmissions.
Conclusions: Among geriatric screening tools, ISAR was independently associated with discharge destination in older adults transferred from ED to intermediate care. Predictive validity was poor. Further research on selection of candidates for alternatives to conventional hospitalization is needed.

Chronic diseases are prevalent in older adults, are associated with negative health outcomes and reduced quality of life, and represent a burden for health care systems, with high utilization of acute hospital beds.[1,2] Moreover, hospitalization of elderly patients in non-specialized environments might increase the risk of unfavorable health outcomes, such as delirium and death.[3,4]

Intermediate-care institutions, which in different health care systems might be identified, for instance, with community hospitals or skilled nursing facilities, have been proposed as alternatives to conventional acute hospitalizations for selected patients with flared-up chronic diseases.[5,6] The 2011–2015 Health Plan of the autonomous region of Catalonia, Spain, prioritizes the implementation of alternatives to conventional hospitalization for patients with multimorbidity,[7] mainly relying on an existing network of intermediate-care post-acute hospitals, which are traditionally dedicated to geriatric rehabilitation and palliative care. In these institutions, specific wards, named as "Subacute Care Units" (SCUs), have been reoriented to the care of older adults with reactivated chronic diseases or

The authors declare no conflicts of interest.
The study was performed using internal funding of Parc Sanitari Pere Virgili.
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http://dx.doi.org/10.1016/j.jamda.2015.04.009
1525-8610/

minor acute events in the context of clinical-social complexity. These units are provided with low technology but with geriatric specialization of the staff and an adapted environment. Direct admission from emergency departments (EDs) has been promoted, to reduce unnecessary acute hospital admissions.[8] Because of the resources and characteristics of these units, direct admission requires an optimal selection of candidate patients.

The aim of our study was to evaluate if easy, quick, and inexpensive geriatric screening tools predict a discharge destination different from returning to the previous living situation for patients admitted to an SCU.

Methods

Design

This was a cohort study.

Study Population and Setting

Patients consecutively transferred to the SCU of Parc Sanitari Pere Virgili from the ED of Vall d'Hebron University Hospital in Barcelona, where they had been selected by a consulting geriatric team, during 14 months (February 2012–April 2013). Inclusion criteria for direct transfer to intermediate care were (1) exacerbated chronic comorbidities (eg, heart failure or chronic obstructive pulmonary disease) or "minor" acute events (ie, urinary tract or respiratory infections) superimposed to chronic diseases, (2) hemodynamic stability, (3) not needing complex diagnostic testing, (4) social situation and support allowing the return to the usual living place. Parc Sanitari Pere Virgili is a 350-bed facility that includes geriatric rehabilitation, palliative care, and long-term nursing care units, with available 24-hour geriatricians, expert nurses, physiotherapists, and social workers, plus X-ray and urgent laboratory testing. The hospital provides teaching for residents in geriatrics and medical students. Goals of the SCU include completing medical treatments and providing comprehensive geriatric assessment and individualized interdisciplinary geriatric care so as to prevent or manage complications of hospitalization in older adults (eg, immobilization, delirium, falls).

Baseline Evaluation

We used data from the hospital's routine comprehensive geriatric assessment, which includes demographics (age, sex), marital status, clinical characteristics (main admission diagnosis, Charlson comorbidity index [best–worst score], prevalent pressure ulcers, Emina scale for risk of pressure ulcers [0–15, best–worst]), cognitive impairment (history of dementia, Pfeiffer Short Portable Mental Questionnaire [0–10, best–worst]), and disability in the basic activities of daily living (Barthel Index [0–100, dependency–autonomy]). At admission to our SCU, we administered 3 geriatric prognostic tools: (1) the Identification of Seniors at Risk (ISAR) scale, a simple 6-question test (score 0–6, best–worst) validated in the ED to predict adverse health outcomes after home discharge,[9] which takes into account function (premorbid and post-acute change), polypharmacy, cognitive and visual impairment, and recent hospitalizations; (2) the Silver Code (score 0–30, best–worst), validated in the ED to predict 1-year mortality,[10] which combines demographics, polypharmacy, comorbidities, and previous hospitalizations; and (3) the Walter indicator (score 0–20, best–worst) predicts 1-year mortality at hospital discharge[11] and combines demographics, clinical aspects (heart failure, cancer with or without metastases), and laboratory testing (albumin, creatinine). To improve the clinical meaningfulness and eventual practical use of the results, we used continuous score as well as cutoffs to identify patients at risk, based on previous works for SilverCode (>11 points)[12] and Walter indicator (>6 points).[11] Top versus other 2 tertiles (>3 points), a cutoff already used in the literature,[13] was used for the ISAR. Data were collected by expert physicians or nurses working in the unit, which were selected, trained, and stable during the study period. Because these data were extracted from our usual health electronic records software, patients did not sign a specific ad hoc informed consent other than a general consent, which allows using their anonymous data for different clinical and study purposes. The study protocol was approved by the Committee for Ethics in Animal and Human Experimentation of the Universitat Autònoma de Barcelona.

Outcome

According to the goals of these units, which promote a prompt management of the acute condition and a rapid discharge to previous living place, we selected the following variable as an outcome: discharge to the usual living situation (home or usual nursing home) versus a different discharge destination (death, return to the acute hospital, or transfer to long-term nursing care). In our system, long-term nursing care units represent an intensive nursing resource, belonging to the health care department, dedicated to managing health care conditions (skin wounds or other complex situations in chronic and disabled older adults) within a limited timeframe (<3 months). This resource is different from a nursing home, which belongs to the welfare and social system. In this sense, the outcome combined 3 health-related reasons of not returning home. Quality requirements of the Catalan health care administration set >70% of discharges to previous living situation.

Statistical Analysis

To assess the association between baseline variables and the outcomes, we used χ^2 test (dichotomous variables) and t test (continuous variable). Variables showing a bivariate association with the outcome ($P < .05$), and with clinical meaningfulness, were entered in a stepwise Cox proportional hazards model. We built different models including ISAR, Silver Code, and Walter as either continuous or dichotomous variables. Because the Walter indicator was calculated on only 84% ($n = 223$) of the sample, because of limited availability of laboratory testing results, whereas the other scales on virtually 100% of the sample, we first excluded the Walter indicator from the multivariable analyses, including it in further analyses. To further explore the impact of social status on the outcome (particularly on discharge to long-term nursing care) we conducted analyses comparing baseline variables and the outcomes between married and not married participants. Finally, we ran receiving operator characteristic (ROC) curves to determine the prediction of the outcomes using the selected scales plus a number of other geriatric variables (disability in basic activities of daily living, dementia, and pressure ulcers) that might have a practical impact on discharge destination and were associated with the outcomes, at least in bivariate analyses. We first assessed the area under the curve (AUC) for continuous measures and then, in light of a potential clinical translation, for the specified dichotomous variables. Statistical analysis was performed using SPSS 19.0 (IBM SPSS Statistics, IBM Corporation, Chicago, IL).

Results

We enrolled 265 patients (mean age ± SD = 85.31 ± 7.54 years, 69% women) with previous clinical and social complexity (37.8% had dementia, mean Charlson Index ± SD was 2.36 ± 1.58, 72% were not