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Brief Report

Direct Admission to Intermediate Care for Older Adults With Reactivated Chronic Diseases as an Alternative to Conventional Hospitalization

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A B S T R A C T

Keywords:

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extended care facilities**Background:** When reactivations of chronic diseases cannot be managed at home, postacute intermediate-care geriatric units (ICGUs) might provide adequate and specialized support to primary care, based on comprehensive geriatric assessment and rehabilitation.**Objectives:** To explore if direct admission to ICGUs of older adults with reactivated chronic diseases or acute common conditions superimposed to chronic diseases might be an alternative clinical pathway to conventional acute hospitalization followed by intermediate care rehabilitation.**Methods:** Quasiexperimental pilot study. We compared characteristics at admission and outcomes at discharge between two groups admitted to our ICGU: the first one admitted directly, and the second one admitted to complete treatment and rehabilitation after discharge from acute hospital.**Results:** Sixty-five patients from the same primary care area (mean age $\pm$ SD 85.6 ± 7.2 , 66% women) were admitted to the ICGU for the same main diagnostics, mainly reactivation of heart failure and chronic obstructive pulmonary disease: 32 directly from home (DA) and 33 following acute hospital discharge (HD). Baseline clinical, functional, and social characteristics, as well as outcomes at discharge, including mortality and acute transfers, were comparable between groups. Global length of stay was significantly higher in HD, compared with DA (60.8 ± 26.6 vs 38.4 ± 23 days, $P < .001$).**Conclusions:** From our preliminary results, direct admission to geriatric intermediate care units might represent a potential alternative to acute hospitalization for selected older patients.

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The progressive ageing of the population of Western countries, associated with the increasing prevalence of chronic comorbidities, determines a high use of hospital resources, with consequent relevant costs for the health care system. Moreover, in older adults, hospitalization contributes to different negative health outcomes.^{1,2}

Intermediate-care geriatric units (ICGUs) have the goal, among others, of shortening acute hospitalizations, and possibly avoiding unnecessary hospital admissions in community-dwelling patients, when possible.^{3,4} Proactive follow-up of chronic older adults by expert primary care teams might prevent hospitalizations.^{5,6} When reactivations of chronic diseases cannot be managed in the home environment because patients require more frequent monitoring, a higher intensity of care, or caregivers cannot manage the situation at home, intermediate care at geriatric postacute units might provide

adequate and specialized support,⁷ based on comprehensive geriatric assessment and rehabilitation and reducing acute complications in older patients.^{8,9}

The aim of this study was to explore if, in selected geriatric patients with reactivated chronic diseases, direct admission to an ICGU might be an alternative to acute hospitalization, followed by intermediate-care rehabilitation. In particular, we compared older adults with reactivated chronic diseases or common acute medical conditions superimposed to complex chronic conditions, who were admitted directly to a geriatric ICGU from home, with patients, from the same geographic area, who were discharged to the same ICGU from the acute hospital, where they had been referred for a comparable set of primary diagnostics. Our hypothesis was that outcomes at discharge could be comparable between groups.

Methods

In this quasiexperimental pilot study, we compared characteristics and outcomes between 2 groups of older patients all living in

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the same area (Vallcarca/Sant Gervasi, Barcelona, Spain) consecutively admitted to our ICGU from January to November 2011. The first group was admitted to the ICGU directly from home after reactivated chronic diseases or common acute diseases superimposed to chronic conditions [direct admission (DA)]; the second group was admitted to ICGU to complete treatment and rehabilitation after discharge from an acute hospital, where patients had been admitted for the same main medical reasons [hospital discharge (HD)]. Besides the living area and the admission diagnostics (*International Classification of Diseases, Ninth Revision*), we matched participants by age.

The Vallcarca/Sant Gervasi primary care teams and the Hospital Socio-Sanitari Pere Virgili implemented a clinical pathway for direct admission to the ICGU. In the primary care team, family physicians are strictly coordinated with a home care unit (physician and nurse), which is dedicated to follow complex chronic patients. According to the pathway, patients requiring more intensive monitoring or treatments were directly admitted to the ICGU if diagnostic orientation was clear and no complex testing was required (DA). Our teaching hospital, which in other health care systems also could be defined as a skilled nursing facility, is a publically funded facility owned by the Catalan's Health Department, and has up to 315 ICGU total beds. It has 24-hour specialized geriatric and nursing assistance, urgent blood tests, and simple x-ray. Controls (HD) followed usual pathways.

We used the available clinical and administrative data from the hospital's information system. First, we compared the following ICGU characteristics, recorded during the first 24 hours of admission: demographics, comorbidity (Charlson index), number of medications, risk of falls (Downton scale), risk of pressure ulcers (Emina scale), functional (Barthel index), cognitive (Pfeiffer Short Portable Mental Status Questionnaire), and social status (living alone). Outcomes at discharge, collected at the end of the process, included mortality, transfer to the acute hospital, ICGU length of stay, and global length of stay (acute + ICGU). We extracted from our information software, without any link with patient's personal data, data previously collected for clinical purposes. For this reason, we did not request an informed consent. We used analysis of variance (continuous variables) and chi-squared test (categorical variables), or Mann-Whitney *U* and Fisher tests as nonparametric

tests, if required. For exploratory multivariable analyses, we used logistic or linear regression, depending on the outcome. Data were analyzed using SPSS 15.0 (SPSS Inc, Chicago, IL).

Results

Of a total of 1846 patients admitted to our facility during the study period, 65 (mean age $\pm$ SD 85.58 ± 7.16 , 66% women) were admitted to the ICGU for reactivated chronic diseases or common acute diseases superimposed to chronic conditions from the selected pilot geographic areas. Main admission conditions were heart failure (55.4%), chronic obstructive pulmonary disease (20.0%), chronic kidney disease (9.2%), urinary infections (6.2%), and others (9.2%). There were 32 DAs and 33 HDs. HDs had accumulated 13.1 ± 7.1 days (mean $\pm$ SD) of acute hospitalization before ICGU admission. The 2 groups were comparable for baseline characteristics and for outcomes at discharge (Table 1). Because of the acute hospitalization, the global length of stay of HDs was significantly higher (Table 1). In exploratory multivariable models, including age, gender, and Barthel Index, the outcomes did not differ between groups, except for global length of stay ($P < .001$, data not shown).

Discussion

In our study, compared with those discharged to ICGU from an acute hospital, older adults with reactivated chronic diseases referred to ICGU directly from home had similar baseline clinical-functional profiles and comparable outcomes at discharge, with shorter global hospital stay. The initial hypothesis of the study was that, regardless of the baseline characteristics, the result of the whole processes could be comparable between groups (HD/DA), with potential reduction in the use of acute resources.

Few intervention studies suggested benefits of ICGU in terms of health results and efficiency for older adults with chronic diseases, compared with usual care in the general hospital.^{3,4} To our best knowledge, no study explored the effectiveness of direct admission to ICGU from home, although this seems a diffuse practice in some countries.¹⁰ On the other hand, hospital-at-home schemes might avoid unnecessary hospitalizations in this population.⁵ However, especially for older adults, home care is feasible only when adequate caregiving is available and if the acute or subacute condition does not require intense clinical monitoring and treatment. In other situations, efficient hospital resources, possibly alternative to the acute ones, could be necessary.

Limitations of the study include the following: lack of randomization, small sample size, and lack of information on the severity of the condition determining the admission, even if the groups were comparable for the main clinical-functional confounders or modifiers. Among strengths were a comprehensive geriatric assessment with no missing data, strong and reliable outcomes, and the lack of strict inclusion/exclusion criteria (eg, cognitive, social) that might allow reproducing "real-world" conditions.

Conclusions

Our preliminary results encourage the design of larger randomized studies to evaluate direct admission to geriatric intermediate care units as an alternative to acute hospitalization for selected older patients.

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Table 1
Baseline Characteristics at Admission and Outcomes at Discharge from the ICGU

	Acute Discharge, n = 33	Direct Admission, n = 32	P Value
Baseline characteristics			
Age	84.7 $\pm$ 7.11	86.5 $\pm$ 7.21	.31
Female gender	25 (38.5)	18 (27.3)	.10
Lives alone	8 (12.3)	9 (13.8)	.72
Comorbidity (Charlson index)	2.45 $\pm$ 1.48	2.59 $\pm$ 1.54	.71
No. medications	9.0 $\pm$ 3.58	9.91 $\pm$ 2.70	.25
Functional status (Barthel index)	66.03 $\pm$ 30.45	54.65 $\pm$ 27.58	.13
Cognitive status (Pfeiffer SPMQ)	2.53 $\pm$ 3.07	1.72 $\pm$ 2.23	.25
Falls risk (Downton scale)	4.23 $\pm$ 2.33	4.87 $\pm$ 1.54	.21
Pressure ulcer risk (Emina scale)	5.26 $\pm$ 2.91	5.42 $\pm$ 2.40	.76
Outcomes at discharge			
Mortality	5 (7.7)	3 (4.6)	.48
Transfer to acute hospital	4 (6.2)	4 (6.2)	.96
Length of stay at ICGU	47.63 $\pm$ 25.54	38.40 $\pm$ 23.01	.13
Global length of stay (acute + ICGU)	60.78 $\pm$ 26.58	38.40 $\pm$ 23.01	<.001

ICGU, intermediate care geriatric unit; SPMQ, Short Portable Mental Status Questionnaire.

Data are mean $\pm$ SD or n (%). Bivariate comparisons were obtained through chi-square or Fisher exact test (dichotomous variables) and *t* test or Mann-Whitney *U* (continuous variables).

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