

2023-2024

THÈSE

pour le

DIPLÔME D'ÉTAT DE DOCTEUR EN MÉDECINE

Qualification en Médecine Générale

BACK-UPUG :
Predicting Early Unplanned Readmission
of Older Patients After Short-Stay Post-
Emergency Geriatric Unit Hospitalization

BACK-UPUG :
Prédire la Réhospitalisation Précoce des
Patients Agés Après une Hospitalisation
en Unité Post-Urgence de Gériatrie

MORISSET Dorine

Née le 11 avril 1996 à Amboise (37)

Sous la direction de Monsieur le Docteur BRIERE Olivier

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Signé par l'étudiante le 07/08/2024.

SERMENT D'HIPPOCRATE

« Au moment d'être admise à exercer la médecine, je promets et je jure d'être fidèle aux lois de l'honneur et de la probité. Mon premier souci sera de rétablir, de préserver ou de promouvoir la santé dans tous ses éléments, physiques et mentaux, individuels et sociaux. Je respecterai toutes les personnes, leur autonomie et leur volonté, sans aucune discrimination selon leur état ou leurs convictions. J'interviendrai pour les protéger si elles sont affaiblies, vulnérables ou menacées dans leur intégrité ou leur dignité. Même sous la contrainte, je ne ferai pas usage de mes connaissances contre les lois de l'humanité. J'informerai les patients des décisions envisagées, de leurs raisons et de leurs conséquences. Je ne tromperai jamais leur confiance et n'exploiterai pas le pouvoir hérité des circonstances pour forcer les consciences. Je donnerai mes soins à l'indigent et à quiconque me les demandera. Je ne me laisserai pas influencer par la soif du gain ou la recherche de la gloire.

Admise dans l'intimité des personnes, je tairai les secrets qui me seront confiés. Reçue à l'intérieur des maisons, je respecterai les secrets des foyers et ma conduite ne servira pas à corrompre les mœurs. Je ferai tout pour soulager les souffrances. Je ne prolongerai pas abusivement les agonies. Je ne provoquerai jamais la mort délibérément.

Je préserverai l'indépendance nécessaire à l'accomplissement de ma mission. Je n'entreprendrai rien qui dépasse mes compétences. Je les entretiendrai et les perfectionnerai pour assurer au mieux les services qui me seront demandés.

J'apporterai mon aide à mes confrères ainsi qu'à leurs familles dans l'adversité. Que les hommes et mes confrères m'accordent leur estime si je suis fidèle à mes promesses ; que je sois déshonorée et méprisée si j'y manque ».

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List of abbreviations

[illegible]

Plan

LIST OF ABBREVIATIONS

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APPENDIX

BACK-UPUG: Predicting Early Unplanned Readmission of Older Patients After Short-Stay Post-Emergency Geriatric Unit Hospitalization

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ABSTRACT

Introduction. Specific short-stay Post-Emergency Geriatric Units (PEGUs) might reduce length of stay and iatrogenic loss of independence without increasing the risk of early readmission. The aim of this study was to evaluate the rate and predictive risk factors for early rehospitalization in a PEGU.

Methods. The BACK-UPUG study is a retrospective observational study conducted at a Post-Emergency Geriatric Unit (University Hospital of Angers) over nearly one year, including patients hospitalized in the unit and discharged home. Socio-demographic and medical data, frailty assessments, initial main diagnoses, and outcomes were recorded from patient's medical records. The early readmission rate within 30 days after discharge was calculated, and statistical descriptive, univariate and multivariate analyses were carried out.

Results. A total of 450 patients were included in the analysis (mean age 88 years; 39.3% men, 60.7% women). Of these, 75 patients (16.6%) were readmitted within one month after home discharge. Early readmission rate was significantly associated with excessive polypharmacy (odds ratio [OR] = 1.95; $p = 0.014$), being known by our geriatric team (OR = 2.36; $p = 0.001$), a history of recent hospitalization (OR = 2.00; $p = 0.038$), and initial severity criteria such as respiratory failure (OR = 1.94; $p = 0.049$) or hemodynamic disorders (OR = 3.91; $p = 0.029$). An initial hospital admission diagnosis of infectious disease was a protective factor (OR = 0.45; $p = 0.023$).

Conclusion. This model of short-stay Post-Emergency Geriatric Units is a viable solution for enhancing elderly care. Identifying risk factors for early rehospitalization can improve the selection of suitable patient profiles for this type of unit, enabling the effective initiation and organization of their care following a brief geriatric assessment.

Keywords. Frail elderly; Post-Emergency Geriatric Unit; readmission rate.

INTRODUCTION

The aging population presents an important challenge to healthcare systems worldwide, especially in developed countries. By 2050, approximately one out of six persons of the global population will be aged 65 and above, reaching 25% in regions such as Europe and North America (1). This demographic shift brings with it specific medical complexities, including multiple comorbidities, polypharmacy, loss of autonomy, increased risks of disease decompensation, and higher mortality rates, which require specialized care (2,3).

Additionally, the recent healthcare crises, particularly exacerbated by the COVID-19 pandemic, have highlighted persistent challenges opposing rising healthcare demands for geriatric care and persistent bed closures in public hospitals (4). According to a French prospective cohort study in 2023, spending even a single night in the emergency department (ED) is associated with a 40% increase in mortality among frail elderly patients compared to those directly admitted to wards in the context of increasingly crowded EDs (5–7). This underscores the need to find viable solutions to complement emergency departments.

To address the growing need for healthcare access, especially in the field of emergency medicine, while considering the specificities of an aging and vulnerable population, specialized teams and units have gradually emerged. These include mobile geriatric teams (8,9), geriatric emergency departments (10), and more recently, Post-Emergency Geriatric Units (PEGUs). Established in 2002 by the French Regional Health Organization System, these acute geriatric care units are managed by geriatricians and are characterized by very short stays, typically less than one week (11).

The primary objective of these specific PEGUs, in addition to providing acute care, is to conduct comprehensive geriatric assessments, including medical and psychosocial evaluations, to plan healthcare while highlighting frailties. They aim to compensate for these frailties during very short hospital stays, in order to minimize the risk of functional decline and loss of autonomy associated with prolonged hospitalization (12).

The University Hospital of Angers thus have established during the COVID-19 pandemic in December 2021 a crisis Tension Hospital Geriatric Unit, based on this post-emergency unit model, which later evolved into a Post-Emergency Geriatric Unit . One of the challenges of this unit is to select the right patient profiles, chosen by both emergency physicians and geriatricians, who could benefit from a short hospitalization without subsequent risk.

The early rehospitalization rate is often used as one of several indicators of the quality of care (13).

We aim to establish criteria to improve the selection of incoming patients hospitalized in PEGU, identifying profiles suitable for short-term management without subsequent risk of rehospitalization.

Our objective was thus to determine the rate and the risk factors of early readmission in a Post-Emergency Geriatric Unit.

METHODS

The BACK-UPUG study is a retrospective observational study conducted in the Post-Emergency Geriatric Unit (PEGU), at the University Hospital of Angers (France), from December 2022 to October 2023 (Clinical Trials ID: NCT06239935). All baseline characteristics were retrospectively collected from patients' medical records.

1. Study population

Patients included in the BACK-UPUG study were adults aged 75 years and older admitted to the PEGU of the University Hospital of Angers, France, from December 1st, 2022 to October 16th, 2023, who did not object to the collection of anonymized clinical and biological data for research purposes.

The exclusion criteria were as follows: patients who were transferred to other specific acute medical wards during their hospitalization (i), who died during hospitalization (ii), patients admitted directly to the PEGU without going through the emergency department (ED) (iii), patients that were administratively attached to another ward (iv), and patients who had already been included during a first stay in the PEGU (v).

2. Characteristics

For all study patients, socio-demographic data (age, gender, and condition of living) were retrospectively collected. Independence data were also gathered, such as the presence of formal assistance, which was considered as living in a nursing home or benefiting from assistance at home (excluding household help). A frailty assessment was made using a retrospective evaluation with available written data of the Clinical Frailty Scale (CFS) score, a frailty assessment tool from 1 (very fit) to 9 (terminally ill). Hospital admission diagnosis and home care maintenance issues mentioned in the ED's conclusion, as well as initial medical severity criteria in the ED, were recorded. These included hemodynamic disorders (systolic

blood pressure < 90 mmHg), respiratory failure (respiratory rate > 30/min or signs of respiratory distress or hypoxia on arterial blood gas or oxygen requirement exceeding 6 L/min), renal failure (increase of creatinine by more than fifty percent), or neurological failure (vigilance disorders or delirium). The Charlson comorbidity index is a tool to predict 10-year survival in patients with multiple comorbidities such as heart, neurological, pulmonary or hepatic diseases, diabetes, dementia or cancer. It was calculated according to the medical history documented in the patient's medical records. We also recorded body mass index (BMI), the number of treatments (distinct substances according to the 5th level of Anatomical Therapeutic Chemical (ATC) classification system), as well as whether the patient was already known by the geriatric team of the University Hospital of Angers or not. Recent hospitalization (hospitalization or an ED visit dated less than a month before PEGU admission), length of stay, and discharge places after hospitalization in the PEGU were also collected.

3. Outcome

We considered early readmission as a visit to the ED or as a direct hospitalization in an acute medical unit within thirty days after PEGU discharge (14), collecting the data only from the University Hospital of Angers database.

4. Covariates

Potential confounding factors included age, sex, formal assistance, Charlson comorbidity index, excessive polypharmacy (defined as ten or more medications (15–17)), being known by our geriatric team, recent hospitalization, infectious disease as hospital admission diagnosis, Clinical Frailty Scale score of five or more (18), hemodynamic disorders, respiratory failure, or renal failure.

5. Statistical analysis

The participants' characteristics were summarized using means and standard deviations, or frequencies and percentages, as appropriate.

Firstly, comparisons between participants who were readmitted or not readmitted after PEGU discharge were performed using Chi-square test (or Fisher's exact test) or Student's t-test (or Mann-Whitney Wilcoxon test according to the normality assessment), as appropriate.

Secondly, logistic regressions were used to examine the associations between different confounding factors and early rehospitalization. The odds ratio, together with its 95% confidence interval [CI] and the corresponding p-value, were calculated for the assessment of relative risks for early readmission, using logistic regression. Multivariate analysis was performed including age, sex, and all variables associated with a p-value < 0.10 in the univariate analysis. A stepwise descending analysis was employed to select the most relevant variables in order to minimize the risk of overfitting. All statistics were performed using SAS® version 9.4 software (Sas Institute Inc) and a p-value < 0.05 was considered significant.

6. Ethic

The study was conducted in accordance with the ethical standards of the Helsinki Declaration (1983). No participants or relatives objected to the use of anonymized clinical and biological data for research purposes. Ethics approval was obtained from the Ethics Board of the University Hospital of Angers, France (2023/133). The study protocol was also declared to the National Commission for Information Technology and civil Liberties (CNIL;ar23-0105v0).

RESULTS

Between December 1, 2022 and October 16, 2023, a total of 721 patients were admitted to the University Hospital of Angers Post-Emergency Geriatric Unit (PEGU), and all of them were enrolled in the BACK-UPUG study. Out of these patients, 450 participants met the eligibility criteria and were included in the analysis (Figure 1). The mean age was 88 years (Interquartile Range (IQR) 83-91), with 60.7% of women; most of them lived at home (72.2%). The mean length of stay was 5 days (IQR 4-7) and was similar between groups (Table I).

The main hospital admission diagnoses were infectious disease (26.9%), fall or mobility disorders (24.7%) and acute cardiac pathology (11.6%) (Appendix 1).

A total of 16.6% of the 450 patients were readmitted within thirty days after PEGU discharge. Among the 75 rehospitalized patients, 37.3% were readmitted for the same admission diagnosis, including 35% for fall or mobility disorders.

Table 1 details the characteristics of participants based on whether they were readmitted or not. Early rehospitalization was higher in persons benefiting from formal assistance (60.5% vs 76%, $p = 0.011$). This group also displayed increased comorbidity, as indicated by an elevated Charlson comorbidity score ($p = 0.036$), used more than 10 medications per day ($p = 0.004$), was frailer according to the CFS score ($CFS \geq 5$ 69.9% vs 85.3%, $p = 0.006$) and was more often known by our geriatric team (35.5% vs 60%, $p < 0.001$). They also had a history of hospitalization in the month preceding their admission to the PEGU (12.3% vs 24%, $p = 0.008$). Upon emergency admission, patients who were early rehospitalized more often displayed severity criteria such as renal failure ($p = 0.024$). However, having an initial hospital admission diagnosis of infectious disease was a protective factor for early rehospitalization (28.8% vs 17.3%, $p = 0.041$).

These results are corroborated by an analysis using univariate logistic regression, except for the Charlson comorbidity index. Using the absence of early rehospitalization as the reference (odds ratio [OR] = 1), the OR for patients previously known by our geriatric team who were early rehospitalized was 2.01 [95% confidence interval (CI): 1.15-3.54] ($p = 0.015$) after adjusting for all potential confounders. In the adjusted model, patients who had infectious disease as the hospital admission diagnosis had a lower risk of rehospitalization within 30 days (OR = 0.41 [95% CI: 0.20-0.83], $p = 0.014$). Of note, respiratory failure in the ED emerged as a risk factor for early rehospitalization in the multivariate analysis (OR = 1.98, $p = 0.046$) (Table II). A subgroup analysis was conducted among patients returning to their original place of residence after discharge from the PEGU and showed no significant difference in early rehospitalization.

Using stepwise descending analysis to select the most appropriate and significant variables in the adjusted model for potential confounders, we found that, in addition to the previously cited factors, excessive polypharmacy (OR = 1.95, $p = 0.014$), recent hospitalization (OR = 2.00, $p = 0.038$), and hemodynamic disorders in the ED (OR = 3.91, $p = 0.029$) were associated with a higher risk of early rehospitalization in patients admitted to the PEGU (Table II).

DISCUSSION

In this study, the rate of readmission within one month was 16.6%, and excessive polypharmacy, being known by our geriatric team, a history of recent hospitalization, and initial severity criteria (respiratory failure and hemodynamic disorders) were significant risk factors for early readmission, whereas infectious disease was a protective factor.

Post-Emergency Geriatric Units (PEGUs) are a new model of elderly care characterized by a short length of stay, with a highly variable mean length of stay in France, ranging from 3.5 to 17 days, with an average around 7 days (19). The model of our unit at University Hospital of Angers is based on a very short-stay post-emergency unit, with a significantly low length of stay of 4.3 days. Most of the literature report results from classical geriatric units with higher mean length of stay (ranging from 11 to 15.8 days (4)), and only a few studies concern specific PEGUs.

The global early readmission rates for elderly patients range from 10.3% to 37.6% in conventional acute geriatric medicine services (14). However, some French studies have shown a reduction to between 10.8% and 17%, indicating that a shorter length of stay in our unit does not appear to increase the early rehospitalization rate (20).

Multiple risk factors for rehospitalization are identified in the literature, related either to patients' intrinsic characteristics (socio-demographic profile, functional and clinical status), their environment (social environment, support of caregivers), or to the index hospitalization (length of stay, evaluation by a specialized geriatric team) (13,14,20–25).

Among these risk factors, those linked to patient frailty play an important role according to a systematic review, particularly malnutrition, risk of falls, reduced mobility, excessive polypharmacy, comorbidity and functional dependence (14). In our study, excessive

polypharmacy was the only risk factor for rehospitalization that could be considered a frailty factor.

Numerous studies have demonstrated that excessive polypharmacy is linked to frailty, and it also emerges as an independent risk factor for frailty and even as a predictor of mortality (15,16,26). The Clinical Frailty Scale (CFS) is widely recognized in the literature as a reliable pre-hospital tool that offers a straightforward clinical assessment by integrating comorbidity, disability and cognitive impairment. CFS has been identified as an independent predictor of adverse health outcomes, including all-cause mortality, length of stay, functional decline and also all-cause readmission, as noted by Falk Erhag, et al. in a systematic review (22). In addition, high comorbidity is also associated with a higher rate of early readmission, especially in chronic heart and pulmonary disease, as well as with the severity of initial illness (13,23,24). However, neither the CFS nor the Charlson Comorbidity Index appear to be significantly associated with early rehospitalization in the adjusted model of our study, whereas being known by our geriatric team does seem to be. We might consider that it is the highest-risk, most comorbid, and frailest patients who are followed by geriatric specialists at the University Hospital of Angers, making this a potential indirect marker of patients' frailty.

A recent history of hospitalisation (13,21,25) or repeated hospitalizations (23,27) during the past year are significant risk factors for readmission, which is consistent with our study.

However, most of the literature studies evaluate these risk factors for early rehospitalisation in classical acute geriatric units, and only two studies have specifically investigated them in very short-stay PEGUs. Not only did Traissac et al. find no connection between shorter stays and higher rates of early readmission, but they also demonstrated that a longer length of stay in PEGUs negatively impacts early readmission rates (28). Indeed, although literature remains contradictory regarding length of stay as a risk factor for early rehospitalization (14), it

suggests that longer stays can lead to iatrogenic loss of independence, affecting already fragile patients (12,29). The estimated loss of functional independence according to the French Haute Autorité de Santé (HAS), ranges from 30% to 60%, with 10% considered avoidable (30). Moyet et al. indicated that the introduction of PEGUs has shortened the average hospital stay for older patients, reducing the risk of iatrogenic dependence, without increasing early readmission rates within 30 days (28). The primary cause of hospital admission in PEGUs in both studies previously mentioned, as well as in the BACK-UPUG study, was infectious disease. Our study found this to be a protective factor against early rehospitalization. This suggests that patients with infections can return home quickly without a subsequent risk of readmission after a brief hospitalization initiating and adjusting antibiotics and organizing home care. Thus, these patients may be suitable candidates for admission to the PEGU.

Some limitations should be acknowledged. Our study was retrospective, relying exclusively on data from computerized medical records. Consequently, there is some missing data such as body mass index (BMI), delirium or pre-existing cognitive disorders. Adjusting the results for certain initially selected covariates, such as pre-existing cognitive disorders, was thus not possible due to the extent of missing data. Diagnosis of delirium is one of the early rehospitalisation risk factors in PEGUs found by Traissac et al. (28) and by Gauthier et al. (27). However, we were unable to highlight this potential factor due to the numerous missing data particularly due to the lack of a precise definition of delirium or the difficulty in evaluating this neurological failure in the ED. In addition, although most rehospitalizations occur within the same hospital, it is estimated that the rate of admission to another hospital ranges from 20% (large hospitals) to 40% (small hospitals), which may potentially underestimate the early rehospitalization rate (14,31).

It would be valuable to conduct a multicentric study using a prospective approach to minimize missing data encountered in our study. Comparing readmission rates and risk factors with those from a traditional acute geriatric care service would also help to more precisely target patients for each type of service.

We chose to define early readmission as a readmission within 30 days after discharge from PEGUs. Indeed, most readmissions considered avoidable in the literature occur within the first month after discharge. They are often associated with the care management during the index hospitalization (32). This raises concerns about substandard initial care, such as incomplete resolution of the main problem, poorly balanced treatments at discharge, or inadequate post-hospitalization care planning. However, this assessment of care quality is limited by the existence of numerous independent non-modifiable factors such as age, frailty, comorbidities, and initial severity (13).

Furthermore, randomized prospective trials have shown that between 12% and 75% of all readmissions can be prevented by patient education, predischARGE assessment, and domiciliary aftercare (33). Facchinetti et al. demonstrated that implementing continuity of care (telephone follow-up, home visits, patient therapeutic education) reduced the risk of readmission within 1 month by 16% (34). This underscores the need for effective post-discharge care coordination, particularly involving primary care physicians and home care nurses. We could provide geriatric medical and psychosocial assessments to the patient's medical and paramedical caregivers via phone, mail, or through a prompt discharge summary, before or shortly after discharge. Another suggestion could be to systematically schedule a consultation with the general practitioner, especially for high-risk patients. Enhancing communication with community care

physicians through these measures may improve patient care and potentially reduce the rate of early readmissions.

CONCLUSION

The short-stay Post-Emergency Geriatric Unit model appears to be a viable solution for enhancing elderly care without increasing the risk of early readmission, particularly for less frail patients hospitalized for infectious disease. By promptly organizing post-discharge care following a comprehensive geriatric assessment, this model helps to reduce iatrogenic loss of independence.

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DATA AVAILABLE STATEMENT

Patient level data are freely available at DRCI@chu-angers.fr to qualifying researchers registered with an appropriate institution and who submit a proposal with a valuable research question. There is no personal identification risk within this anonymized raw data, which is available after notification and authorization of the competent authorities.

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FIGURES

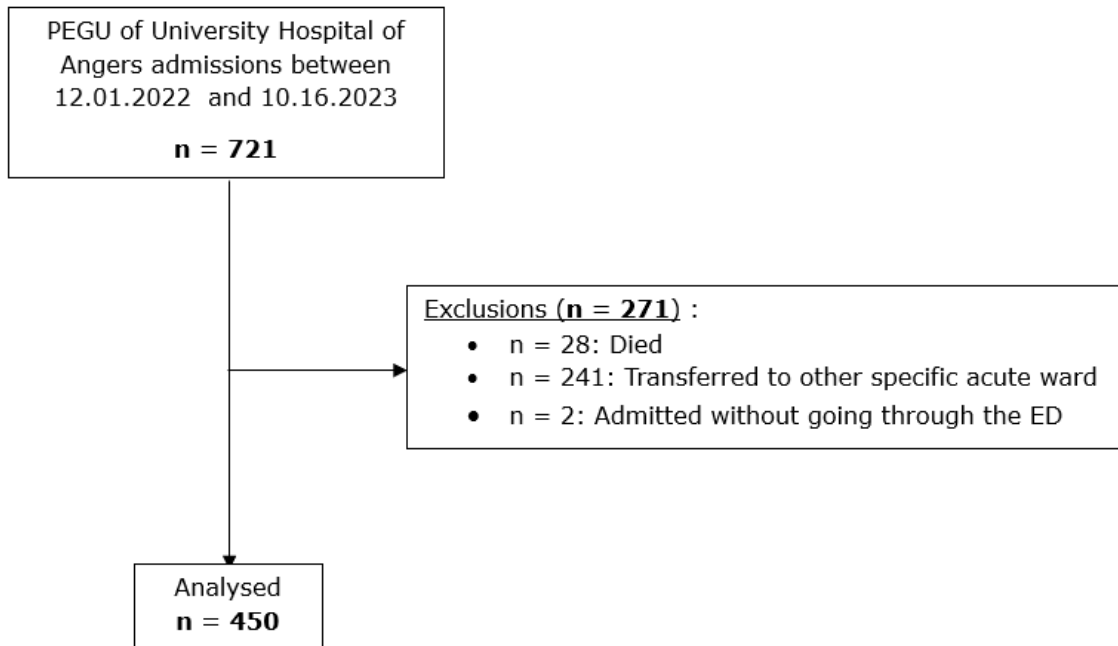


Figure 1. Flow Diagram.

PEGU: Post-Emergency Geriatric Unit. ED: Emergency Department.

TABLES

Table I. Characteristics and comparison of admitted patients (n = 450) separated into two groups of early rehospitalized and non-early rehospitalized patients.

		Rehospitalization		
	Total (n = 450)	No (n = 375)	Yes (n = 75)	p-value*
General characteristics:				
Female gender, n(%)	273 (60.7)	226 (60.3)	47 (62.7)	0.698
Age, years, med[IQR]	88 [83-91]	87 [83-91]	88 [82-92]	0.884
Living place, n(%)				0.793
Home	325 (72.2)	271 (72.3)	54 (72.0)	
Residential care facility / Senior residence	63 (14.0)	51 (13.6)	12 (16.0)	
Nursing home	62 (13.8)	53 (14.1)	9 (12.0)	
Formal assistance, n(%) ∞	284 (63.1)	227 (60.5)	57 (76.0)	0.011
Comorbidities and treatments:				
Charlson Comorbidity Index, med[IQR]	7 [5-8]	6 [5-8]	7 [6-9]	0.036
Excessive polypharmacy, n(%) †	136 (30.2)	103 (27.5)	33 (44.0)	0.004
Patient's pathways:				
Known by our geriatric team, n(%)	178 (39.6)	133 (35.5)	45 (60.0)	<0.001
Recent hospitalization, n(%) ‡	64 (14.2)	46 (12.3)	18 (24.0)	0.008
Home care maintenance issues, n(%) Ω	60 (13.3)	50 (13.3)	10 (13.3)	1.000
Length of stay, days, med[IQR]	5 [4-7]	5 [4-7]	6 [4-7]	0.294
Emergency information/initial severity:				
Hospital admission diagnosis, n(%) Ω				
Infectious disease	121 (26.9)	108 (28.8)	13 (17.3)	0.041
Fall / Mobility disorders	111 (24.7)	93 (24.8)	18 (24.0)	0.883
Acute cardiac pathology	52 (11.6)	42 (11.2)	10 (13.3)	0.598
CFS score ≥ 5, n(%)	326 (72.4)	262 (69.9)	64 (85.3)	0.006
Hemodynamic disorders, n(%) α	14 (3.1)	9 (2.4)	5 (6.7)	0.066
Neurological failure, n(%) β	74 (16.4)	60 (16.0)	14 (18.7)	0.570
Respiratory failure, n(%) £	75 (16.7)	57 (15.2)	18 (24.0)	0.062
Renal failure, n(%) ¥	55 (12.2)	40 (10.7)	15 (20.0)	0.024

* Between-group comparisons based on Chi-square test (or Fisher's exact test) or Student's t-test (or Mann-Whitney Wilcoxon test according to the normality assessment), as appropriate; ∞ Domicile or nursing home, excluding household help; † Use of ≥ 10 medications per day (ie, distinct substances according to the 5th level of Anatomical Therapeutic Chemical [ATC] classification system); ‡ Hospital admission (acute ward or emergency department visit) less than 30 days prior to the Post-Emergency Geriatric Unit admission; Ω Mentioned in the Emergency Department's conclusion; α Systolic blood pressure < 90 mmHg; β Vigilance disorders or delirium; £ Respiratory rate > 30/min, signs of respiratory distress, hypoxia on arterial blood gas or oxygen requirement exceeding 6L/min; ¥ Renal failure (increase of creatinine more than fifty percent).

CFS : Clinical Frailty Scale.

Table II. Univariate and multivariate logistic regression showing the odds ratio for patients early rehospitalized after PEGU discharge, adjusted for patient's characteristics and stepwise descending analysis (n=450).

	Rehospitalized					
	Unadjusted model		Adjusted model		Stepwise descending analysis	
	OR [CI 95%]	P-value	OR [CI 95%]	P-value	OR [CI 95%]	P-value
Female gender	1.11 [0.66-1.85]	0.698	0.96 [0.54-1.71]	0.883		
Age	1.00 [0.96-1.04]	0.989	0.98 [0.94-1.03]	0.439		
Formal assistance ∞	2.07 [1.17-3.65]	0.013	1.30 [0.66-2.57]	0.453		
Charlson Comorbidity Index	1.10 [0.99-1.23]	0.071	1.02 [0.90-1.16]	0.742		
Excessive polypharmacy †	2.08 [1.25-3.45]	0.005	1.76 [0.99-3.11]	0.053	1.95 [1.15-3.33]	0.014
Known by our geriatric team	2.73 [1.64-4.54]	<0.001	2.01 [1.15-3.54]	0.015	2.36 [1.39-4.01]	0.001
Recent hospitalization ‡	2.26 [1.22-4.17]	0.009	1.93 [0.99-3.11]	0.054	2.00 [1.04-3.86]	0.038
Infectious disease	0.52 [0.27-0.98]	0.044	0.41 [0.20-0.83]	0.014	0.45 [0.22-0.90]	0.023
CFS score ≥ 5	2.51 [1.28-4.94]	0.008	1.67 [0.74-3.76]	0.219		
Hemodynamic disorders α	2.91 [0.95-8.93]	0.063	3.26 [0.92-11.61]	0.068	3.91 [1.15-13.29]	0.029
Respiratory failure £	1.76 [0.97-3.21]	0.064	1.98 [1.01-3.86]	0.046	1.94 [1.01-3.74]	0.049
Renal failure ¥	2.09 [1.09-4.03]	0.027	1.94 [0.95-3.97]	0.070		

∞ Domicile or nursing home, excluding household help; † Use of ≥ 10 medications per day (ie, distinct substances according to the 5th level of Anatomical Therapeutic Chemical [ATC] classification system); ‡ Hospital admission (acute ward or emergency department visit) less than 30 days prior to the Post-Emergency Geriatric Unit admission; α Systolic blood pressure < 90 mmHg; £ Respiratory rate > 30/min, signs of respiratory distress, hypoxia on arterial blood gas or oxygen requirement exceeding 6L/min; ¥ Renal failure (increase of creatinine more than fifty percent).
CI: Confidence Interval; OR: Odds Ratio; CFS: Clinical Frailty Scale.

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APPENDIX

Appendix I. Hospital admission diagnosis mentioned in the emergency department's conclusion (n = 450).

	Total (n = 450)
Infectious disease	121 (26.9)
Fall / Mobility disorders	111 (24.7)
Acute cardiac pathology	52 (11.6)
General health deterioration / Malnutrition	33 (7.3)
Others	32 (7.1)
Neurological disease (except delirium or neurocognitive disorders)	27 (6.0)
Digestive disease (except infection)	22 (4.9)
Delirium	16 (3.6)
Acute pulmonary disease (except infection)	15 (3.3)
Pain	13 (2.9)
Neurocognitive disorders / Behavioural disorders	6 (1.3)
Palliative care	2 (0.4)

BACK-UPUG : Prédire la Réhospitalisation Précoce des Patients Agés Après une Hospitalisation en Unité Post-Urgence de Gériatrie

RÉSUMÉ

Introduction: Les Unités Post-Urgence de Gériatrie (UPUG) pourraient réduire la durée d'hospitalisation et la perte d'indépendance iatrogène sans augmenter le risque de réhospitalisation précoce. Cette étude vise à évaluer le taux et les facteurs de risque prédictifs de réhospitalisation précoce dans une UPUG.

Méthode: L'étude BACK-UPUG est une étude observationnelle rétrospective réalisée au sein de l'Unité Post-Urgence Gériatrique (Centre Hospitalier Universitaire d'Angers) pendant près d'un an, incluant les patients hospitalisés dans l'unité avant retour à domicile. Les données socio-démographiques et médicales, une évaluation de la fragilité, les diagnostics médicaux principaux initiaux et les devenir après l'hospitalisation ont été recueillis à partir des dossiers médicaux des patients. Le taux de réhospitalisation précoce dans les 30 jours suivant la sortie a été calculé, et des analyses statistiques descriptives, univariées et multivariées ont été effectuées.

Résultats: Un total de 450 patients a été inclus dans l'analyse (âge moyen de 88 ans; 39,3 % d'hommes, 60,7 % de femmes). Parmi ceux-ci, 75 patients (16,6 %) ont été réhospitalisés dans le mois suivant la sortie à domicile. Le taux de réhospitalisation précoce était significativement associé à une polymédication excessive (Odds Ratio (OR) = 1,95; $p = 0,014$), au fait d'être suivi par notre équipe de gériatrie (OR = 2,36; $p = 0,001$), à une hospitalisation récente (OR = 2,00; $p = 0,038$), et à des critères de sévérité initiaux tels que l'insuffisance respiratoire (OR = 1,94; $p = 0,049$) ou les troubles hémodynamiques (OR = 3,91; $p = 0,029$). Un diagnostic initial d'infection était un facteur protecteur (OR = 0,45; $p = 0,023$).

Conclusion: Ce modèle d'unités post-urgence de gériatrie s'avère être une solution viable pour améliorer la qualité des soins des personnes âgées. L'identification des facteurs de risque de réhospitalisation précoce peut permettre d'améliorer la sélection des profils de patients adaptés pour ce type d'unité, facilitant l'initiation et l'organisation de leurs soins après une brève évaluation gériatrique.

Mots-clés: Personne âgée fragile; Unité Post-Urgence de Gériatrie; taux de réadmission.

BACK-UPUG : Predicting Early Unplanned Readmission of Older Patients After Short-Stay Geriatric Post-Emergency Unit Hospitalization

ABSTRACT

Introduction: Specific short-stay Post-Emergency Geriatric Units (PEGU) might reduce length of stay and iatrogenic loss of independence without increasing the risk of early readmission. The aim of this study was to evaluate the rate and predictive risk factors for early rehospitalization in a PEGU.

Methods: The BACK-UPUG study is a retrospective observational study conducted at a Post-Emergency Geriatric Unit (University Hospital of Angers) over nearly one year, including patients hospitalized in the unit and discharged home. Socio-demographic and medical data, frailty assessments, initial main diagnoses, and outcomes were recorded from patient's medical records. The early readmission rate within 30 days after discharge was calculated, and statistical descriptive, univariate and multivariate analyses were carried out.

Results: A total of 450 patients were included in the analysis (mean age 88 years; 39.3% men, 60.7% women). Of these, 75 patients (16.6%) were readmitted within one month after home discharge. Early readmission rate was significantly associated with excessive polypharmacy (odds ratio [OR] = 1.95; $p = 0.014$), being known by our geriatric team (OR = 2.36; $p = 0.001$), a history of recent hospitalization (OR = 2.00; $p = 0.038$), and initial severity criteria such as respiratory failure (OR = 1.94; $p = 0.049$) or hemodynamic disorders (OR = 3.91; $p = 0.029$). An initial hospital admission diagnosis of infectious disease was a protective factor (OR = 0.45; $p = 0.023$).

Conclusion: This model of short-stay Post-Emergency Geriatric Units is a viable solution for enhancing elderly care. Identifying risk factors for early rehospitalization can improve the selection of suitable patient profiles for this type of unit, enabling the effective initiation and organization of their care following a brief geriatric assessment.

Keywords: Frail elderly; Post-Emergency Geriatric Unit; early readmission.