European Geriatric Medicine 6 (2015) 554–560

Available online at ScienceDirect www.sciencedirect.com

Elsevier Masson France EM|consulte www.em-consulte.com/en

Research paper

What is the course of behavioural symptoms and functional conditions in hospitalised older people with dementia? A multicentre cohort study in Italy

J. Dagani [a,*], L. Iozzino [a], C. Ferrari [a], M.E. Boero [b], C. Geroldi [a], G.M. Giobbio [c], P. Maggi [c], A.L. Melegari [b], G. Sattin [d], M. Signorini [d], O. Zanetti [a], G. de Girolamo [a,*], for the Perdove-Anziani group [a,b,c,d,1]

[a] IRCCS Istituto Centro San Giovanni di Dio, Fatebenefratelli, 4, via Pilastroni, 25125 Brescia, Italy
[b] Presidio Ospedaliero Riabilitativo Beata Vergine della Consolata, 70, Via Fatebenefratelli, 10077 San Maurizio Canavese, Turin, Italy
[c] Centro Sacro Cuore di Gesù, 54, viale San Giovanni di Dio, 20078 San Colombano al Lambro, Milan, Italy
[d] San Raffaele Arcangelo Hospital, 3458, Campo Madonna Dell'Orto, 30100 Venice, Italy

ARTICLE INFO

Article history:
Received 27 January 2015
Accepted 13 June 2015
Available online 4 August 2015

Keywords:
Dementia
Epidemiology
Outcome assessment
Hospitalization
Patient discharge

ABSTRACT

Introduction: Dementia is one of the major causes of disability and dependency among older people worldwide, and hospitalization occurs frequently in demented patients. The present study examined the course of behavioural symptoms and functional conditions in hospitalised older people with dementia.
Materials and methods: Prospective cohort study of 179 demented patients (age > 64 years) admitted to four geriatric units, evaluated at admission, discharge and at 6 months after discharge. An analysis of predictors of functioning improvement was performed.
Results: Patients with no symptoms at NeuroPsychiatric Inventory baseline assessment did not show any changes at both discharge and follow-up, while patients with symptoms at baseline showed an improvement in every subscale from admission to discharge. Using Barthel Index as a measure of functioning, we found a significant improvement in both "admission-discharge" and "discharge-follow-up" timeframe for the most impaired patients. However, for the less impaired patients, no significant changes emerged from admission to discharge, while a significant worsening occurred from discharge to follow-up. The significant associated variables with improvement in Barthel Index from discharge to follow-up were age and Blaylock Risk Assessment Screening Score at admission.
Conclusion: Interesting trends in the course of hospitalized older patients with dementia have been found, and they were associated to different levels of functional impairment at admission. Further research is still needed to understand the predictors of improvement and worsening in such hospitalized patients.

1. Introduction

Dementias are increasingly becoming a major public health problem as they represent a major cause of disability in later life, and have a considerable impact on social health.

As known, one of the main risk factors associated with the onset of dementia is age, and the aging of the population is a trend that affects the majority of Western countries.

Management of the growing numbers of individuals with dementia is an emerging health care crisis [1], associated with the increasing prevalence of dementia with age and the expanding population of older adults.

* Corresponding authors. Tel.: +00 39 0303501329 (J. Dagani); Tel.: +00 39 0303501590; fax: +39 030 3533513.
E-mail addresses: jdagani@fatebenefratelli.it (J. Dagani), liozzino@fatebenefratelli.it (L. Iozzino), cferrari@fatebenefratelli.it (C. Ferrari), mboero@fatebenefratelli.it (M.E. Boero), cgeroldi@fatebenefrateli.it (C. Geroldi), gmgiobbio@fatebenefratelli.it (G.M. Giobbio), paolo_maggi@ymail.com (P. Maggi), annalucia.melegari@gmail.com (A.L. Melegari), gsattin@fatebenefratelli.it (G. Sattin), matteo.signorini@afar.it (M. Signorini), ozanetti@fatebenefratelli.it (O. Zanetti), gdegirolamo@fatebenefratelli.it (G. de Girolamo).
[1] The Perdove-Anziani group includes the following: E. Chitò, G. Kuffenschin, G. Lussignoli, A. Rossetti, M. Cavallaro, N. Cosentino, S. Dessì, A. Lamilia, T. Naldi, C. Nodari, A. Mancuso, D. Volpe, D. Rigodanza, R. Loiero, C. Bertinetti, R. Romiti, P. Secreto and S. Zamburlini.

http://dx.doi.org/10.1016/j.eurger.2015.06.003
1878-7649/

Hospital admission for people with dementia can be disorientating and lead to challenging behaviour [2], and such patients suffering from cognitive impairment upon admission have a higher risk of functional decline during hospital stay [3].

Given the impact of hospitalization on older patients with dementia in terms of behavioural symptoms and functioning [2,3], this research group deemed relevant to evaluate the benefits and the issues/disadvantages associated to hospital admissions.

The recent literature has paid little attention to this aspect, while only few cohort studies have studied how effective hospital care is for demented patients older than 65 years in terms of clinical/functional outcomes [4–7]. In addition, no prospective study, to our knowledge, has sought to re-evaluate such patients at follow-up using standardized instruments in order to investigate the course of behavioural symptoms and functional conditions a few months after hospitalization. The present study focused on hospitalized older patients with dementia included in the Perdove-Anziani cohort study [8], evaluated at admission, discharge and 6 months after discharge.

2. Materials and methods

2.1. Study design

The Perdove-Anziani study aimed at evaluating, with a multidimensional approach, 329 consecutive older patients (age > 64 years) admitted to geriatric units in four Italian "St. John of God" facilities in Brescia, Turin, Venice and near Milan, from June through October 2011 (4 months, excluding August). The study was approved by the Ethical Committee of the St. John of God Order facilities of Northern Italy, and each patient was asked to sign an informed consent form (when medical records indicated incapacity to give informed consent, that was requested from responsible family members or caregivers); all procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 and 2008. Out of the 329 patients enrolled, 179 had a diagnosis of dementia. This study analyses the standardized clinical evaluation and follow-up of that subgroup of patients, admitted to four of the Perdove-Anziani participating units: two Alzheimer rehabilitation units ($n = 161$), a post-acute long-term care unit ($n = 12$) and a neurological rehabilitation unit ($n = 6$).

A "Patient File" was completed for each patient: the file recorded surveyed sociodemographic, clinical, and treatment-related data at admission (T0), during hospitalization or at discharge (T1; patients were assessed either at discharge, or 3 months after hospital admission if still hospitalized, in an efforts towards achieving a fair degree of homogeneity in our sample's evaluation timing). Six months after discharge (T2), each patient was re-evaluated using a standardized phone interview.

At T0, patients were also evaluated with a set of standardized instruments and tools including:

- NeuroPsychiatric Inventory (NPI) [9]: for the evaluation of psychopathology; in our study, it was mainly used for the evaluation of behavioural symptoms;
- Barthel Index [10]: an ordinal scale ranging from 0 to 100 used to measure performance in basic (self-care) activities of daily living;
- Tinetti Scale [11]: for the assessment of mobility, balance and gait, and risk of falling;
- Mini Mental State Examination (MMSE) [12]: used to screen for cognitive impairment [13];
- Instrumental Activities of Daily Living (IADL) [14]: for the evaluation of the pre-admission functioning;
- Charlson Comorbidity Index [15]: a standardized tool for the evaluation of comorbidities that assigns a score from 1 through 6 to 20 comorbidity diseases.

Patients were then re-assessed at T1 with the same standardized instruments (with the exception of IADL).

The "Patient File" also included the Blaylock Risk Assessment Screening Score (BRASS) [16], completed by the treating clinician within the first week of hospitalization, to evaluate any post-discharge problem and/or prolonged hospital stay risk.

At T2, 6 months after the T1 evaluation, each patient (or a trustworthy caregiver) was contacted for a standardized telephone interview that included the Barthel Index and the NPI, to monitor the behavioural symptoms and functional conditions.

The Barthel Index was chosen to explore changes in functional conditions over time, because it gives more information about activities of daily living than IADL, and it is sensitive to minute changes in functional capacity [17,18].

The primary end-point was the evaluation of clinical and functional outcomes at discharge and at 6-month follow-up of such cohort of patients with dementia.

2.2. Statistical analysis

Descriptive statistics, such as frequency and percentage for categorical data as well as mean and standard deviation for continuous variables, were used to describe the main characteristics of the sample. Considering the non-normality of the NPI scales distribution, basically due to the frequent zero-valued scores, we dichotomized each subscale into two categories: "no symptoms" and "presence of symptoms". A multivariable binary logistic regression model (carried out by using the stepwise method) was performed to select, among the totality of the NPI subscales (covariates), those more correlated to the presence of dementia (dependent variable). For these subscales, the median score changes over time were evaluated.

Functional outcome was analysed by stratifying the sample on the basis of its admission Barthel Index score and, afterwards, score differences over time were tested by repeated measure Anova through Bonferroni correction for pairwise comparisons.

Finally, univariate binary logistic regression models were computed to detect predictors of improvement in functional conditions from discharge (T1) to follow-up (T2): difference of Barthel Index score, re-codified in "improved" and "unimproved" was set as dependent variable.

All analyses were performed using SPSS (Statistical Package for Social Sciences, SPSS Inc., Chicago, IL) version 21.0. Statistical significance was set at $P < 0.05$.

3. Results

In the Perdove-Anziani cohort ($n = 329$), 59% were female and the mean age was 78.4 (SD = 6.6) years. The patients' mean length of stay ranged from 30 to 90 days, with a mean of 56.8 days (SD = 34.3). The 40.1% of patients are widowed, and has a primary school degree, while just 16.7% attended senior high school or university.

The recruited sample was quite heterogeneous in terms of symptomatology, severity and functioning, and the most frequent diagnosis were hypertension ($n = 196$), followed by dementia ($n = 179$): 108 patients had a diagnosis of Alzheimer disease, 44 had a different type of dementia (e.g. dementia with Lewy bodies, vascular dementia, frontotemporal dementia, and dementia associated with Parkinson disease), and 27 had a mixed diagnosis (Alzheimer disease and other types of dementia in comorbidity). The multidimensional diagnosis of dementia was made according to the common criteria [19–23] on the basis of a