Ancianos: relación entre residencia y estado de salud

Elderly: relationship between residence and health status

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ABSTRACT

Introduction: The European population is aging, for every 100 young people there are 128 elderly. There is a decrease in the number of elderly people living in their family environment. The main objective of this study is to identify the differences in the general health status of the elderly according to their residence: in families or in others types of centres (nursing home, host family or national integrated network of integrated care (NINIC)).

Material and Methods: This is an observational study, using a sample of 254 elderly patients admitted to the Internal Medicine Service.

Results: Of the patients studied, 78,7% lived at home/with relatives, 15,4% in nursing homes, 3,15% in host families and 2,75% in NINIC. Age ranged from 65 to 99 years, with a median of 80 years (SD=7,97). Patients from their homes were more independent/mild dependence ($X(3)=59.8$, $p<0.001$), although there were no significant differences in the number of comorbidities ($t(252)=0.029$, $p=0.999$). However, patients from others centres had more neurological pathology ($X(1)=12.39$, $p<0.001$). There were no statistically significant differences in the number of medications usually taken, although patients from others centres had more potentially inappropriate medications ($t(252)=5.85$, $p<0.001$) and potential prescribing omissions ($t(252)=3.71$, $p<0.001$). Patients at home had fewer rehosts ($X(1)=5.14$, $p=0.039$). There were more intercurrences ($X(1)=19.0$, $p<0.001$) and more deaths at 6 months after discharge ($X(1)=16.3$, $p<0.001$) from others centres.

Conclusion: In a population less attended by families, these differences in relation to their dwelling places are paramount.

Keywords: Elderly; Nursing home; House; Health status; Host families.

INTRODUCTION

With the various changes in society, both socially and economically, there is a reduction in the number of elderly people living in their homes, leaving the family to be the main caretaker[1]. In 2011, about 19% of the population aged 65 or over (elderly). The aging rate of the population worsened to 128 (102 in 2001), which means that for every 100 young people there are 128 elderly people[2].

Aging leads to the possibility of greater dependence, which is associated with increased costs and decreased quality of life. The Katz scale assesses the autonomy of the elderly to perform the basic and essential activities of daily life, called Basic Activities of Daily Living (BADLs)[1].

The need for care is sensitive and influenced by moral and cultural aspects. Several studies have evaluated the preference of the elderly as to who cares for them. Despite all cultural and social differences, studies are consensual in the preference of the elderly for being cared for by relatives even when they are in palliative care[3]. But besides this preference being evidently influenced by affection and familiarity, this study intends to verify if are there differences in care. Does the type of caregivers, such as the house (home, nursing home; national integrated network of integrated care (NINIC) or host family) influence health status?

On the other hand, the elderly have more comorbidities and are more polymedicated, so they are more subject to iatrogenesis and inadequate prescriptions that include potentially inappropriate medications (PIM) and potential prescribing omissions (PPO), identified by the STOPP criteria (Screening Tool of Older Persons' Prescriptions) and START criteria (Screening Tool to Alert to Right Treatment)[4,5].

Several studies proven the association between PIM and PPO with adverse pharmacological effects, hospitalizations, morbidity and mortality, functional disability and consequently associated with more costs[6,7]. Hence it is important to determine whether there are significant differences in the number and type of PIM and PPO according to the provenance of the patients. This study has as main objective to evaluate the differences between the provenances of the elderly that were hospitalized in the Internal Medicine Service and how the origin influences the basal state of health, the hospitalization and the evolution after discharge.

MATERIAL AND METHODS

A retrospective observational study was performed to evaluate the differences in health status according to the origin of the patients. The research protocol was approved by the Ethics Committee of the Unidade Local de Saúde do Alto Minho (ULSAM). Taking into account the 2011 census, the district of Viana do Castelo consists of 56,851 elderly people, 2 for a 95% confidence interval (calculated by Epiinfo®, version 7.2.1.0), the representative sample of the population of Viana includes 254 elderly people. Patients aged 65 or over who were admitted to the Internal Medicine Unit of ULSAM since January 1, 2019 to a total of 254 consecutive patients hospitalized in the beds under the responsibility of the authors, and hospitalization through the emergency service occurs randomly by the service. Patients in palliative care and in-hospital deaths were excluded because it was not possible to evaluate the PPO introduced, PIM suspended, rehospitalization and death within 6 months after discharge.

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The patients were separeted in two groups according to their residence: in families our in others types of centres (nursing home, host family or national integrated network of integrated care (NINIC).

There is no consensus on the definition of polymediction, but the value of 5 or more drugs is the most consensual, so this was the value assigned[8].

The degree of dependence was assessed by the Katz scale before the acute phase, admission and discharge[1].

Charlson index is a method of classifying comorbidity provides a simple, readily applicable and valid method of estimating risk of death from comorbid disease[9].

The STOPP / START criteria were used to assess the PIM and PPO, but updated according to the latest recommendations. Particulary with regard to hypocoagulation in atrial fibrillation[10], to the prescription of proton pump inhibitors[11] and antipneumococcal vaccination[12].

The classification of the professions was made by the Portuguese classification of the professions 2010. The evaluation of the number of outpatient consultations took into consideration only the consultations made by doctors. It was considered excessive alcohol consumption, if superior to the recommended one (up to 10gr, 20gr if man from 18 to 64 years); addiction was considered a psychiatric illness[13].

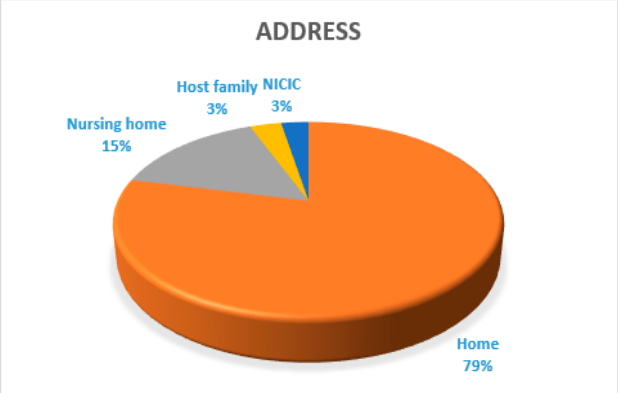
STATISTICAL ANALYSIS

Statistical analysis was performed in the Statistical Package for Social Sciences (SPSS) version 24. The descriptive statistical analysis was performed by the evaluation of the absolute and relative frequencies of the categorical variables and by the calculation of the mean, median and standard deviation in the continuous variables. A *Kolmogorov-Smirnov (KS)* test was used to determine the distribution of continuous variables if the number of cases was greater than 50 and by the *Shapiro-Wilk test (SW)* if the number of cases was lower. In the comparison of means between groups, for the variables with normal distribution, the *Student t Test (t)* was applied. The *Mann-Whitney U test (U)*, if the independent variable was binary, was applied to the normal independent variables with more than 3 categories, and the *Kruskal-wallis H* test (H), in which case had more than 2 categories. In the case of dependent variables, the *Wilcoxon test (W)* was used. For the evaluation of the relationship between two categorical variables, the *Chi-square test ($\chi 2$)* was used, and when its assumptions were not assured Fisher's Exact Test was used. To measure the degree of correlation between two quantitative variables *Pearson's Correlation Coefficient* was used. The value of statistical significance for all tests was defined as 2-sided $p < 0.050$.

RESULTS

A total of 254 cases were evaluated and categorized according to their address in the domicile, home, host family and NICIC. Of the 254 cases, 200/254 live at home / with relatives (78.7%), and 54/254 (21.3%) in outher centres (39 in nursing homes (15.4%), 8 (3.15%) in host families and 7 (2.75%) in NICIC (Graph 1)).

Graph 1. Distribution of cases according to provenance.



The age of the 254 cases ranged from 65 to 99 years, with a median of 80.0 years (SD=7.97). There were no significant differences between the different sources (t(252)=1.84, p=0.067). 113 cases were male (44.5%) and 141 female (55.5%), with no significant difference between the provenance (X (1)=3.46, p=0.066).

There were no statistically significant differences between schooling (Fisher's exact test =2.82, p=0.969 and profession (Fisher's exact test =11.9, p=0.100) according to the provenance of the cases. Most of the cases were unskilled workers with 4 or less years of schooling (Table 1).

There are statistically significant differences between the degree of dependence according to the provenance of the patients (X(3)=59.8, p<0.001). Patients from the home are more independent/slightly dependent, while those from others centres are more dependent.

There were no significant differences in the number of comorbidities (t(252)=0.029, p=0.999) with all patients having at least a comorbidity with a maximum of 16 and a mean of 6.76 (SD=2.8). Despite this, the Charlson index was superior in patients from others centres than from families (t(252)=5.24, p=0.002).

However there are differences regarding the type of comorbidities, others centres' patients have more neurological pathology (X(1)=12.39, p<0.001).

The hospitalization led to a significant worsening of the degree of dependency in patients from the home (*Z*=-5.16, *p*<0.001) but not to patients from others centres (Table 2).

The number of drugs prescribed ranged from 0 to 19, with a mean of 7.7 (SD=3.5). A total of 1953 medications usually taken by 254 patients. There were no significant differences in the total number of drugs prescribed between the different origins (t(252)=0.66, p=0.610). 81.9% of the cases were polymedicated and only 3 (1.18%) of the patients had no

Table 1. Classification of cases in relation to age, sex, schooling and profession.

	Families	Other centres	Comparation
Age (years)	79.6 (SD=8.2)	81.8 (SD=6.9)	t (252)=1.84, p=0.067
Sex	Male: 95/200 (47.5%) Female: 105/200 (52.5%)	Male: 18/54 (33.3%) Female: 36/54 (66.7%)	X(1)=3.46, p=0.066
Portuguese Classification of Professions			
Professions of the Armed Forces	5/200 (2.50%)	0/54 (0.00%)	Fisher's exact test =11.9, p=0.100
Representatives of the Legislative Power/Executive Bodies, Officers, Directors, Executive Managers	0/200 (0.00%)	0/54 (0.00%)	
Specialists in Intellectual and Scientific Activities	2/200 (1.00%)	0/54 (0.00%)	
Technicians/Intermediate Professions	0/200 (0.00%)	1/54 (1.85%)	
Administrative staff	13/200 (6.50%)	1/54 (1.85%)	
Workers in Personal, Security and Safety Services and Sellers	7/200 (3.50%)	4/54 (7.41%)	
Farmers and Skilled Workers in Agriculture, Fisheries and Forestry	2/200 (1.00%)	0/54 (0.00%)	
Skilled Workers in Industry, Construction and Crafts	34/200 (17.0%)	3/54 (5.55%)	
Plant and Machine Operators and Assembly Workers	2/200 (1.00%)	1/54 (1.85%)	
Unskilled workers	87/200 (43.0%)	24/54 (44.4%)	
Unknown	48/200 (24.0%)	20/54 (37.0%)	
Education			
Illiterate or <4 years of schooling	52/200 (26.0%)	9/54 (16.7%)	Fisher's exact test =2.82, p=0.969
1st Cycle	60/200 (30.0%)	14/54 (24.9%)	
2nd Cycle	5/200 (2.50%)	1/54 (1.85%)	
3rd Cycle	2/200 (1.00%)	1/54 (1.85%)	
High school	1/200 (0.50%)	0/54 (0.00%)	
Higher education	4/200 (2.00%)	0/54 (0.00%)	
Unknown	76/200 (38.0%)	23/54 (42.6%)	

chronic medications. There were no significant differences between polimedication in the different origins (X(1)=2.27, p=0.092). In spite of this, patients coming from others centres have significantly plus PIM (t(252)=5.85, p<0.001) and PPO (t(252)=3.71, p<0.001). 24.8% of the 326 PIM were suspended and 17.2% of the 203 PPO were introduced. However, there were no statistically significant differences between the number of suspended PIM (X(1)=1.73, p=0.217) or PPO introduced (X(1)=2.31, p=0.156) according to the origin (Table 3).

In the cases from the home, 34.5% of the patients had no prescribed PIM, the number of PIM varied from 0 to 4 with a mean of 1.05 (SD=0.94), of the 209 PIM prescribed, 61 (29.2%) were benzodiazepines, 56 (26.8%) were proton pump inhibitors. The number of PPO ranged from 0 to 4 with a mean of 0.70 (SD=0.78), of the 140 PPO prescribed were introduced 31 (22.1%), the most frequent PPO was the antipneumococcal vaccine in 79 patients (56.4%) followed by antireabsorption therapy in 13 patients (9.29%).

In the others centres' cases, just one patent had no PIM, (98.1% of patient had at leat one PIM). The number of PIM ranged from 1 to 5 with a mean of 2.19 (SD=1.18). Of the 118 PIM, 24 (20.3%) were antipsychotic with no indication, mainly due to its extrapyramidal lateral effects, 21 (17.8%) were PPIs and 18 (15.6%) were benzodiazepines. The number of PPO ranged from 0 to 3 with a mean of 1.17 (SD=0.97), of the 63 PPO were introduced 9 (14.3%), the most frequent PPO was vitamin D in 27 (42.9%) of the cases, followed by 14 (22.2%) the pneumococcal vaccine and 7 (11.1%) antireabsorption therapy.

The days of hospitalization ranged from 1 to 46 days, with a mean of 10.7 (SD=8.4) days. The number of days of hospitalization did not differ significantly according to the origin of the patients (t(252)=6.9, p=0.301). Despite this, there are significant differences in the percentages of readmissions (X(1)=5.14, p=0.039), with patients coming from home to be significantly less readmitted. There were no significant differences in the presence of hospitalizations prior to that included in this study (X(1)=3.54, p=0.077). Patients from families had significantly less complications in hospitalization (X(1)=19.0, p<0.001). Also in relation to death in less than 6 months after discharge there were statistically significant differences, patients from the home died significantly less (X(1)=16.3, p<0.001), the overall death rate was 16.9% (Table 4).

Table 2. Evaluation of the differences regarding the follow-up in outpatient care, degree of dependence / aggravation with hospitalization and comorbidities.

Follow-up in External Consultation	Families	Other centres	Comparation
No outpatient follow-up	75/200 (37.5%)	26/54 (48.1%)	X(6)=3.40, p=0.761
An external consultation	68/200 (34.0%)	17/54 (31.5%)	
Two or more external consultation	57/200 (28.5%)	11/54 (20.3%)	
Degree of dependence prior to admission			
Total dependency	30/200 (15.0%)	33/54 (61.1%)	X(3)=59.8, p<0.001
Moderate to severe dependence	54/200 (27.0%)	17/54 (31.5%)	
Light dependence	22/200 (11.0%)	1/54 (1.85%)	
Independence	94/200 (47.0%)	3/54 (5.55%)	
Aggravation of dependence on hospitalization	Z=-5,16, p<0,001	Z=-0,91, p=0,362	
Number of comorbilities	6.76 (SD=2.8)	6.76 (SD=2.8)	t (252)=0.029, p=0.999
Charlson index	5.84 (SD=1.9)	6.7 (SD=1.4)	t (252)=5.24, p=0.002
Type of comorbidity			
Neurological pathology	82/200 (41.0%)	37/54 (68.5%)	X(1)=12.39, p<0.001
Obesity / Overweight	58/200 (29.0%)	10/54 (18.5%)	X(1)=2.38, p=0.123
Arterial hypertension	155/200 (77.5%)	40/54 (74.1%)	X(1)=0.28, p=0.717
Diabetes Melittus Type 2	77/200 (38.5%)	20/54 (37.0%)	X(1)=0.32, p=0.902
Dyslipidemia	110/200 (55.0%)	33/54 (61.1%)	X(1)=0.65, p=0.444
Excessive consumption of alcohol	18/200 (9.00%)	2/54 (3.70%)	X(1)=1.69, p=0.262
Smoking (ex-smoker or smoker)	39/200 (19.5%)	4/54 (7.41%)	X(1)=5.03, p=0.081
Pulmonary disease	63/200 (31.5%)	13/54 (24.1%)	X(1)=1.11, p=0.320
Cardiac pathology	109/200 (54.5%)	37/54 (68.5%)	X(1)=3.42, p=0.087
Hematologic pathology	40/200 (20.0%)	14/54 (25.9%)	X(1)=1.46, p=0.252
Psychiatric Pathology	57/200 (28.5%)	14/54 (25.9%)	X(1)=0.14, p=0.708
Malignant neoplasm	46/200 (23.0%)	10/54 (18.5%)	X(1)=0.50, p=0.580
Chronic Kidney Disease	37/200 (18.5%)	13/54 (24.1%)	X(1)=0.84, p=0.440
Chronic liver disease	6/200 (3.00%)	0/54 (0.00%)	X(1)=1.66, p=0.347

Statistically significant differences are underlined.

DISCUSSION

Of the 254 cases studied, 78.7% live in the household / with families, 15.4% in Nursing homes, 3.15% in host families and 2.75% in NICIC. In the social charter of 2014, there are 18104 elderly people residing in nursing homes, that is, 3.89% and 775 (0.04%) elderly people living in host families[2,19]. Thus, the question is whether there are older people in these two institutions in our area of study or if these are the elderly who are most hospitalized.

The age and gender distribution of this sample is representative of the Portuguese population over 65 years of age, in which 57.9% are women and 42.1% are men, and there are no significant differences between the different origins[2].

Of the study sample, 49.7% of the patients were illiterate or had less than 4 years of schooling, 49.7% had completed the 1st cycle, 4% had a second cycle, 2% had a 3rd cycle, 0.70% secondary education and 2.7% higher education. These data are in line with national figures[2]. Since gender, age and schooling are similar to national values, the results of this study can probably be extrapolated to the Portuguese population.

Only 5.55% (3/54) of others centres' patients are autonomous, which contrasts with the 47.0% (94/200) of the families' patients. This discrepancy of values can possibly be attributed to the fact that the elderly are more dependent more often hospitalized or our sample of elderly residents in others centres are effectively more dependent[15]. Patients from the home are more independent / slightly dependent, while those coming from others centres are more totally dependent, which is in agreement with other studies[15]. Despite this there are no significant differences in the number of comorbidities. But the number of comorbidities in this sample was high, all patients had at least a comorbidity with a maximum of 16 and a mean of 6.76 (SD=2.8). These numbers are especially important since the number of comorbidities is associated with the risk of hospitalization[16]. In addition, the Charslon index shows the relevance of comorbidities in the

Table 3. Percentage of patients with or without PIM and PPO.

	Families	Others centres	Comparation
Total number of drugs prescribed	7.63 (SD=3.6)	7.91 (SD=3.4)	t (252)=0.66, p=0.610
Potentially Inappropriate Medications (PIM)			
Number	1.05 (SD=0.9)	2.19 (SD=1.2)	t (252)=5.85, p<0.001
PIM suspended	37/131 (28.2%)	20/53 (37.7%)	X(1)=1.73, p=0.217
Potential Prescribing Omissions (PPO)			
Number	0.70 (SD=0.78)	1.17 (SD=0.97)	t(252)=3.71, p<0.001
PPO introduced	24/107 (22.4%)	4/39 (10.3%)	X(1)=2.31, p=0.156

Statistically significant differences are underlined.

Table 4. Duration of hospitalization, rehospitalization, intercurrence and death according to provenance.

	Families	Others centres	Comparation
Duration of hospitalization (days)	10,4 (SD=7,9)	11.7 (SD=10.2)	t (252)=6.9, p=0.301
Rehospitalization	5/200 (2.50%)	5/54 (9.26%)	X(1)=5.14, p=0.039
Previous hospitalizations (<12 months)	65/200 (32.5%)	25/54 (46.3%)	X(1)=3.54, p=0.077
Intercurrences	55/200 (27.5%)	32/54 (59.3%)	X(1)=19.0, p<0.001
Death up to 6 months after discharge	24/200 (12.0%)	19/54 (35.2%)	X(1)=16.3, p<0.001

Statistically significant differences are underlined.

prognosis of patients[9]. Since patients from other centers had a significantly higher Charlson index.

However there are differences regarding the type of comorbidities, others centres' patients have more neurological pathologies, which is in agreement with other studies. Some studies proven that neurological pathologies were associated with longer hospitalizations and higher mortality[17]. The hospitalization led to a significant worsening of the degree of dependence that is in agreement with other studies[17].

Since the number of comorbidities leads to hospitalization, and hospitalization aggravates dependence, once again the importance of prevention, especially in a time when health care costs are so much talked about. Hypothetically, preventing comorbidities decreases the number of hospitalizations, so the direct costs associated with it and the indirect ones, associated with a higher degree of dependence after discharge.

The risks of polymedication and pharmacological interactions, especially in the elderly, are numerous and well known, especially with regard to the risk of hospitalization, morbidity and mortality[18]. In this study, 81.9% of patients were polymedicated, values much higher than those reported in other studies (20-75%) and only 1.18% of patients had no chronic medications[19]. There are no significant differences in the number of drugs prescribed between the different origins. In spite of this patients coming from others centres have significantly more PIM and PPO which is in agreement with other studies[19]. But it is worrying as more and more elderly people are institutionalized and the adverse effects and consequences of PIM and PPO are known and influence health status in a significant way[5,18,20]. Although other centres' elderly had more PIM and PPO, there were no statistically significant differences between the number of suspended PIMs or PPOs introduced.

The most prescribed PIM were benzodiazepines, antipsychotics and PPIs.

Patients residing in others centres are at greater risk of being medicated with psychotropic medication, both antipsychotics and benzodiazepines, many of them PIM[16,21].

Benzodiazepines are associated with physical dependence, anterograde amnesia and risk of falls[16,21]. Antipsychotics (other than quetiapine and clozapine) are associated with increased risk of stroke, extrapyramidal effects and mortality.[16,21] Chronic use of PPIs is associated with an increased risk of pneumonia, enteric infections eg *C. difficile* and spontaneous bacterial peritonitis due to acid suppression[22,23].

The most common PPO were anti-pneumococcal vaccine, anti-resorptive therapy and vitamin D. According to the clinical guideline standard vaccination against S. pneumoniae infections is recommended in immunocompetent patients

with chronic heart, liver, renal or respiratory disease, pre-transplantation of organ or donation of bone marrow, diabetes mellitus and in case of cerebrospinal fluid fistulas or cochlear implants. In immunocompromised patients it is recommended for splenic dysfunction, primary immunodeficiency, HIV infection, transplant recipients, active neoplastic disease and iatrogenic immunosuppression[12]. Anti-resorptive therapy is recommended in bone densitometry patients at home osteoporosis and frailty patients regardless of the value of densitometry[24]. Vitamin D should be routinely given to institutionalized elderly people because they have low intakes, low sun exposure, and low cutaneous synthesis[25]. Patients from other centres are more readmitted, as proven in other studies[16]. Patients from others centres had significantly more complications during hospitalization. Also in relation to death in less than 6 months after discharge there are statistically significant differences, there were more deaths in patients from others centres (35.2%), while patients from families died significantly less (12.0%). A model identified the independent risk factors for mortality at 1 year after admission of the elderly that varied from 28 to 33%: male; number of BADLs dependent on discharge; congestive heart failure; cancer; creatinine level greater than 3.0 mg/dL and low albumin level. Despite taking into account the destination after the discharge, this study did not consider the provenance of the cases, which could bring significant results[26]. Other factors may be associated with higher post-discharge mortality in patients coming from others centres, such as nutritional status, as several studies have shown that there is better nutrition among the elderly living with their families[27].

Finally, several studies prove that the elderly prefer to be cared by relatives[3], and institutionalized patients have a worse perception of their quality of life[14].

CONCLUSION

In a world that, for cultural, economic and social reasons, the caregivers of the elderly are increasingly "employees" and not family. The association of the origin, here proven, with PIM, PPO, intercurrences during hospitalization, rehospitalization and death becomes even more relevant.

Older people prefer to be cared by family members, being in their family environment gives them quality of care and, by decreasing drug costs, hospitalization and general health, reduces expenses. It is the turning point in the care provided to the elderly in which more training is needed for the "employees", or more support for the family so they can become the caregivers again.

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