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Emergency Hospital Admissions of Elderly Patients with Dementia: General Characteristics, Outcome, and Areas of Improvement at an Accident and Emergency Department

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Keywords

Emergency service, hospital; patient admission; dementia; hospitals, general; primary health care

Abstract

Aim: Age-related disorders, such as dementia, are relevant for healthcare services and health systems worldwide. The prevalence of dementia across European countries is estimated to exceed 7 %, and may rise over time. Those patients are at increased risk for hospital admission and prolonged hospitalization, and such care increases the cost for the healthcare system. Less is known regarding patients with dementia in Greece that visit the Accident and Emergency departments (A&E) in general hospitals. The present retrospective study aimed to address this issue. **Subjects and methods:** The sample of patients and the control group were traced in the A&E department of the University Hospital of Ioannina, Northwest Greece. The study sample consisted of 100 patients with dementia, aged > 65 years and 100 matched controls. The median age of patients with dementia was 85 years, for the control group 83 years, and 63 % were females. In most cases the diagnosis had been made by primary care physicians, and in of patients 21 % by neurologists/psychiatrists. **Results:** In both groups a median of 2 comorbidities was recorded, with hypertension, heart failure and dyslipidaemia being the most common. Fever and falls were the most common reasons for dementia patients visiting the A&E department. Infection was the most common diagnosis in dementia patients, whereas in 17 % of cases no diagnosis was made and no interventions were needed. The probability of admission after an A&E visit was significantly higher for the dementia group, whereas there were no differences regarding length of hospital stay between patients and controls. **Conclusions:** The results of the study are in line with international research and highlight the need for

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the establishment of a national register for patients with dementia, that would enable information exchange between primary and tertiary care and would enable proper diagnosis, management and discharge arrangements.

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Introduction

The population is ageing globally and age-related disorders, such as dementia, have become more relevant for treatment settings and health systems. A previous systematic review of studies on the prevalence of dementia in Western Europe countries, found a prevalence up to 7 % [1]. More recently, a meta-analysis of 7 studies that have been conducted in Eastern and Central European countries yielded similar results, with dementia prevalence 7.1 % in those aged 65 or over. It was also found that dementia prevalence is increasing over time [2]. The diagnosis of dementia has been associated with a higher risk of hospital admission, prolonged hospitalization and higher costs for the healthcare system [3,4]. There is some evidence that several of those admissions could have been avoided and patients would rather be treated in the community, possibly with better outcome [5].

Accident and Emergency departments (A&E) are the first line of hospital reception for such patients. The management of patients with dementia at the A&E may be challenging, as these patients have many multiple comorbidities, difficulties in communication and atypical disease presentation [6]. They may not have a formal diagnosis and medical information may be scarce. Also, A&E environment may not be appropriate and the staff may not be well trained. Moreover, many of the patients may not have appropriate indication for admission at the A&E, and can be managed in the community.

In Greece, according to the European Statistics Office, it is estimated that about 21.5 % of the population are over the age of 65 [7]. The multicentre Hellenic Longitudinal Investigation of Aging and Diet (HELIAD) study for ageing found the overall prevalence of dementia to be 5 % [8]. Less is known with regard to acute presentation at A&E departments and on hospital admissions of patients with dementia in Greece. The aim of the present study was therefore to assess the characteristics of this phenomenon in an A&E setting; to explore the general medical characteristics of acutely ill patients with dementia; and to record the incidence of admission per reason of A&E attendance and the duration of acute hospitalizations of those patients.

Subjects and Methods

The sample of patients and the control group were recruited in the A&E department of the University Hospital of Ioannina. This hospital serves the population of the region of Epirus, Northwest Greece with a population of 337,000 and also covers for specialized medical services a more extended area of the 6th Health Region Administration. Data was collected only for patients who were examined at the medical A&E department.

This is a retrospective descriptive study to assess the characteristics of elderly patients with dementia who visit the A&E Department of the University Hospital of Ioannina in Greece. We aimed to collect all the cases of elderly patients with dementia who visited the medical A&E Department from November 2018 retrospectively either for the last three months or until 100 cases of patients with dementia were identified. In order to finally reach the target of 100 cases, the study was extended to a four-month period, from August 2018 to November 2018. The data was collected through the electronic base of the hospital (GI-CLINIC), where most of the information about patients who visit the hospital is filled (e.g. general and clinical data, admission notes, visits to A&E and clinics). The principal investigator (F.C.) had full access to the demographic data, the clinical notes of the patients who visited the medical department of A&E and the final outcome (admission or discharge), the length of hospitalization and the day of discharge, past visits at A&E, other assessments at day clinics.

The inclusion criteria were age > 65 and history of dementia. The diagnosis of dementia was determined according to the patients' charts. We also attempted to collect data regarding the diagnosis process, i.e., if the patient had ever been assessed and diagnosed by a neurologist or psychiatrist or other physician, by checking the general electronic records of the hospital when available. Each case was matched to a control patient of similar age and same sex without dementia who visited the department on the same day. If there were more than one patient at the control group with the same characteristics, the patient who appeared first in the row of the electronic system list was chosen in order to avoid selection bias. Collected data included the reason for visiting the A&E, comorbidities, the diagnosis they were admitted or discharged with, the final outcome (admission or discharge). We recorded the number of comorbidities per case and filed them in categories such as hypertension, dyslipidaemia, diabetes, heart failure, ischemic heart disease, arrhythmias, stroke, hypothyroidism, chronic obstructive pulmonary disease, cancer, neurological problems, thrombosis (pulmonary embolism, deep vein thrombosis), gastroenterological issues (gastritis, gastric reflux, diverticulitis, liver cirrhosis), chronic kidney disease. Similarly, the reasons for visit were divided in categories to enable comparison between the two groups. The general categories were fever, fall, general deterioration (weakness, anorexia, refusal to eat), altered level of consciousness (coma, acute confusion, loss of consciousness, aggressiveness) or other neurological problems, gastroenterological problems (abdominal pain, diarrhoea, vomiting, liver problems), dizziness, anae-

mia, musculoskeletal issues, blood pressure (low blood pressure, high blood pressure). We attempted to collect data for the place of residence and the carer of these patients. For patients who visited the A&E more than one time only the first visit was recorded. For admitted patients the duration of hospitalization and deaths were recorded. Patients' A&E diagnosis comprised infection (respiratory, urinary, biliary, sepsis, gastroenteritis, not known source), stroke, haemorrhage (mainly gastrointestinal haemorrhage), kidney failure, anaemia, heart failure, electrolyte abnormalities, delirium, arrhythmia, epileptic fit, vertigo, aortic aneurysm, lung mass, metastasis, angina, kidney stone etc. The category of no specific diagnosis included patients who had no intervention at A&E and no specific cause for the visiting problem was found, and finally the patient was discharged home in good condition with instructions for further investigation at an outpatient level or general instructions.

We conducted a statistical analysis with paired logistic regression of the two groups to compare the number of comorbidities, the admissions and the duration of hospitalization, using the SPSS with statistical significance P-value < 0.05.

The study protocol was approved by the Research and Ethics Scientific Committee in the University Hospital of Ioannina.

Results

According to the study protocol, 100 patients with dementia aged > 65 years who visited the A&E from August to November 2018 were selected. Each patient was matched to a patient of the same sex and similar age (+/- 5 years) without dementia, who visited the A&E on the same day. Table 1 presents the main demographic and clinical characteristics of the sample. Patients with dementia and controls were very old (median age > 80 years) and mostly women. As appears in table 1, there was a lot of missing information which was not recorded in the electronic clinical records with regard to career and the place of residence. Only 21 % of patients had been diagnosed with dementia by a neurologist or psychiatrist, 57 % were diagnosed by other physicians, mostly primary care physicians, whereas in 22 % of cases the diagnosis was inferred in the A&E Department according to the history provided by carers. In 72 % of cases the patient received treatment with an acetyl-cholinesterase inhibitor or memantine.

Comorbidities were recorded for both groups. Those diseases were categorized in order to facilitate the proper comparison between patients and controls (Table 2). In the dementia group, 3 % of the patients had no details regarding other diseases, while for the control group there was complete recording. The reasons for visiting the A&E department differed between dementia patients and controls. Fever, falls and general deterioration (which refers to weakness, anorexia, loss of energy) had

Table 1. Demographic and clinical characteristics of patients

Variables	Dementia patients	Controls
Age (median, IQR, years)	85 (80 - 88)	83 (79 - 86)
Sex (female)	63 %	63 %
Carer		
No data	7 %	58 %
Typical	19 %	-
Atypical	61 %	9 %
No carer	13 %	33 %
Residence		
No data	15 %	12 %
Ioannina	73 %	75 %
Outskirts	12 %	13 %
Comorbidities (median, IQR)	2 (2 - 3)	2 (2 - 3)
Outcome		
Admission	73 %	55 %
Discharge	27 %	45 %
Length of hospital stay (median, IQR, days)	6 (4 - 9)	5 (3 - 8)

Table 2. Most common comorbidities in patients with dementia and controls

Comorbidities	Dementia patients (%)	Controls (%)
Hypertension	56	49
Dyslipidaemia	36	32
Diabetes mellitus	25	20
Cardiac		
Heart failure	12	51
Coronary artery disease	12	17
Arrhythmias	20	30
Stroke	20	9
Hypothyroidism	13	4
Chronic obstructive pulmonary disease	8	11
Cancer	2	10

Table 3. Most common diagnoses at the Accident and Emergency department

Primary diagnosis	Dementia patients (%)	Controls (%)
Infections	49	34
Respiratory tract infection	24	7
Urinary tract infection	15	4
Biliary tract infection	4	4
Other	6	19
Stroke	8	12
Bleeding	7	3
Anaemia	3	5
Heart failure	1	5
Electrolyte imbalance	2	4
No diagnosis-discharge without interventions	17	19

been the most common in dementia patients (31 %, 14 % and 13%, respectively). Main reasons for visiting the A&E department for controls were gastroenterology issues (16 %), fever (13 %) and neurological symptoms (12 %). The list of diagnoses was quite extensive, whereas in a proportion of patients in both groups no diagnosis was made and no specific interventions were applied (Table 3). From all patients with dementia 10 % was managed at the A&E and 73 % was admitted, whereas 55 % of the controls were admitted. The two groups were compared for the number of comorbidities, the probability of admission, and the duration of hospitalization. There was no statistically significant difference for the comorbidities (odds ratio 1.083, 95 % CI 0.845 - 1.388, p = 0.530). Also, there was no statistically significant difference on the days of hospitalization (odds ratio 1.029, 95 % CI 0.892 - 1.186, p = 0.696). The probability of admission after an A&E visit was significantly higher for the dementia group (odds ratio 2.835, 95 % CI 1.248 - 4.557, p = 0.006). One death was detected in each group.

Discussion

Emergency services use by patients with dementia has risen over the years [1]. The aim of the present study was to assess the characteristics and the outcome of elderly patients with dementia visiting the A&E. The results may be relevant for improving acute management of patients with dementia. One of the main observations of the present study was that record keeping of the A&E electronic base for patients with dementia was incomplete. It has previously been observed, that in more than one third of the A&E visits there is an information gap, mainly in the sicker and the elderly patients [9,10]. Regarding patients with dementia, it has been shown that due to their disease, the acute confusion and general deterioration, and the incomplete information from the carers, missing information is a regular phenomenon [5]. In the present study only a minority of patients had robust evidence of regular attendance of a psychiatrist or a neurologist, while in about 20 % of the patients with recorded dementia, there was no evidence for the diagnosis prior to their examination at the A&E and patients received no treatment. In most patients (57 %) dementia had been diagnosed by other physicians, mostly in primary care settings. Notably, it has been previously suggested that in Greece, primary care physicians are able to diagnose mental disorders with accuracy [11]. Moreover, a recent study in the United Kingdom found that the diagnosis of dementia may be feasible through electronic primary care record data [12]. Other research has shown that most cases of dementia may be accurately diagnosed by primary care physicians, although a substantial minority may be missed [13]. A previous systematic review suggested that the main reasons for the delayed diagnosis of dementia are communication difficulties, time constrains in the primary care setting, and physicians' inadequate training. Lack of public awareness of the symptoms and signs of dementia may also undermine timely diagnosis [14]. The recognition of dementia cases at the A&E department may be difficult, despite the availability of bedside tests [15]. Most patients with dementia in the present study were between ages 80 and 88 with a median value of 85. This is compatible with previous studies, as age is one of the major risk factors, with a prevalence of dementia around 1 out of 3 patients aged more than 85 years [16]. Regarding sex, 63 % were woman which is also similar to previous epidemiologic studies, with 2/3 of people with dementia being female [16]. Regarding carer status, 63 % of the patients had an atypical carer and 19 % a typical carer, whereas for the rest there was no information available. Similar results have been previously reported by the association of patients with Alzheimer in America, where most of the care was provided by family members [17]. More than two thirds of the patients in our study came from the city of Ioannina for both groups, however there was a lot of missing data on the records regarding the place of residence. Elderly patients who reside closer to the city, seem to have easier and more regular access to the hospital compared to older adults in rural areas, where treatment of neuropsychiatric syndromes in older adults may be more challenging [18]. A more efficient primary

healthcare system could probably reinforce the management of elderly patients with dementia in the community, and link them appropriately to the hospital services when indicated, so as to prevent unnecessary A&E visits [19].

The mean value of comorbidities was two, both for the dementia and the control group. It has been previously reported that comorbidities are a risk factor for dementia development and for frequent A&E visits. Also, people with multiple comorbidities who develop dementia have difficulties in disease management and visit more frequently the A&E [20]. Efficient communication between primary and tertiary care physicians and a joined plan of management could lead to the best care of those patients [21]. The main comorbidities for both groups were hypertension, (almost in 50 %), dyslipidaemia, diabetes and stroke. The risk factors for heart disease have been connected to the development of dementia [22,23]. According to a recent systematic review stroke has been related to cognitive impairment and dementia, though it is not clearly reported as risk factor for the development of dementia [24].

The three main reasons for A&E visit of patients with dementia were fever, falls and general deterioration, while in the control group they were gastroenterological problems, fever and neurological problems. Previous and more recent research has suggested that the main reasons for admission in patients with dementia are chest and urinary infections, and falls, which may lead to increased number and long hospitalizations [25,26]. Importantly, most admissions could have been avoided and patients could have been managed in the community setting [26]. General signs of deterioration like dehydration, feeding problems, are also important factors for hospital visits [27]. In the present study the number of patients with dementia admitted to the hospital was significantly higher than the control group. However, probably due to the small sample, there was no statistically significant difference regarding the duration of hospital stay between the two groups.

It has been reported that the use of hospital services by patients with dementia may be frequent, and such use is linked to worse outcome, whereas it may be an unpleasant experience for both the patients and the carers [19]. This is due to the increase risk of falls, delirium, dysfunction during hospitalization, and also due to the inadequate training of the hospital stuff on the care of people with dementia, the wrong diagnosis, interventions and therapies and lastly due to the hospital environment per se [28,29]. Other research suggested that the health system inefficiency is associated with long and avoidable admissions [30]. According to a previous meta-analysis, many of the A&E visits and hospital admissions could have been avoided and patients could have been managed in community with better outcomes [25]. In the present study, a considerable proportion of patients (17 % for the dementia patients, and 19 % for controls) were discharged without any intervention or significant findings, with instructions for further management in the community. Even the use of the ambulance service and the visit at the A&E department itself can lead to general deterioration, delirium and increased carer stress [28]. This could have been avoided by proper assessment and management in the community, which is often not the case, particularly in rural areas [18].

The present study has some limitations. The patients' sample was derived from the acute medical department of the A&E, so patients with dementia managed in the acute surgical and orthopaedic department for falls and trauma or with acute heart problems managed in the acute cardiology department were not detected. Due to the small sample the two groups could not be compared regarding the reasons for admission, the duration of hospitalization and the deaths. Finally, some cases of patients, or data on comorbidities may have been missed due to incomplete record keeping at the A&E department. The diagnosis of dementia had been mostly made by primary care physicians, but this may not be a limitation, since Greek primary care physicians are able to properly diagnose mental disorders, as aforementioned.

Despite its limitations the present study may have implications for clinical practice. It highlighted the inadequate record keeping in the A&E department, which may complicate accurate diagnosis and management of acutely ill patients with dementia. Accordingly, initiations should be undertaken to improve recording. A previous systematic review concluded that the management of patients with dementia could be improved with the registration of patients in a national database, available for physicians in primary care and the emergency department. Information regarding the diagnosis of dementia, the treatment, the general medical history and the carer status could be readily available at admission through this program, and this will enable proper diagnosis, management and discharge arrangements [31]. Currently, such a register is not available in Greece. Early recognition of dementia and appropriate management in primary and hospital care settings, is one of the main targets for healthy ageing according to World Health Organization [17].

The results of the present study are in line with other similar international studies on patients with dementia and acute hospital service use. This study highlights the information gaps that may undermine care of patients at the A&E departments of general hospitals. Reasons for acute presentation of patients with dementia at the A&E department may differ from other older adults, whereas a noticeable proportion of those patients are discharged

without any intervention, meaning that those visits could have been avoided. The importance of a national register for patients with dementia, connected to the primary care services and to the A&E departments according to international standards, seems rather obvious.

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Conflict of Interest

None to declare.

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