Polypharmacy in nursing home residents with severe cognitive impairment: Results from the SHELTER Study

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Abstract

Objective: Pharmacological treatment of older adults with cognitive impairment represents a challenge for prescribing physicians, and polypharmacy is common in these complex patients. The aim of the current study is to assess prevalence and factors related to polypharmacy in a sample of nursing home (nursing home) residents with advanced cognitive impairment.

Methods: We conducted a cross-sectional analysis of 1449 nursing home residents with advanced cognitive impairment participating to the Services and Health for Elderly in Long Term Care (SHELTER) project, a study collecting information on residents admitted to 57 nursing home in eight countries. Data were collected using the International Resident Assessment Instrument (InterRAI) for long-term care facilities. Polypharmacy status was categorized into three groups: nonpolypharmacy (zero to four drugs), polypharmacy (five to nine drugs), and excessive polypharmacy ($\geq$10 drugs).

Results: Polypharmacy was observed in 735 residents (50.7%) and excessive polypharmacy was seen in 245 (16.9%). Compared with nonpolypharmacy, excessive polypharmacy was associated directly with ischemic heart disease (odds ratio [OR], 3.68; 95% confidence interval [CI], 2.01–6.74), diabetes mellitus (OR, 2.66; 95% CI; 1.46–4.84), Parkinson's disease (OR, 2.84; 95% CI, 1.36–5.85), gastrointestinal symptoms (OR, 1.20; 95% CI, 1.43–3.39), pain (OR, 3.12; 95% CI, 1.99–4.89), dyspnea (OR, 2.57; 95% CI, 1.31–5.07), and recent hospitalization (OR, 2.56; 95% CI, 1.36–5.85). An inverse relation with excessive polypharmacy was shown for age (OR, 0.74; 95% CI, 0.59–0.93), activities of daily living disability (OR, 0.79; 95% CI, 0.63–0.99) and presence of a geriatrician on the nursing home staff (OR, 0.36; 95% CI, 0.20–0.64).

Conclusion: Polypharmacy and excessive polypharmacy are common among nursing home residents with advanced cognitive impairment. Determinants of polypharmacy status includes not only comorbidities, but also specific symptoms, age, and functional status. A geriatrician in the facility is associated with lower prevalence of excessive polypharmacy.

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1. Introduction

Older people often have multiple chronic diseases, resulting in the concomitant use of multiple drug therapies, defined as polypharmacy, and leading to an elevated rate of iatrogenic illnesses [1,2]. The best practice recommended by clinical guidelines seems to be the major cause of polypharmacy [3]. Nevertheless, geriatric patients are usually excluded by the major clinical trials so that no clear evidence is available to drive the decision-making process in these complex patients [4–7]. According to guidelines, physicians should treat, on average, every disease with

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three drugs, and in adults age 80 and older with an average of 3.3 diseases, this results in an average of 10 drugs per person [3].

This situation is complicated further by the coexistence of conditions that cannot be ascribed to a specific organ system pathology and that have multiple causes (geriatric syndromes), and by the presence of disability and cognitive impairment, which are common in this population [8,9]. In particular, cognitive impairment is associated with clinical diseases often observed in older people, including hypertension, cardiovascular disease, diabetes mellitus, and osteoporosis, and might represent a relevant obstacle for prescribing physicians [10]. Several studies have emphasized the need to avoid drugs that may affect cognition or induce delirium when treating patients with coexisting cognitive impairment [11]. In addition, memory loss, decline in intellectual function, and impaired judgment and language, commonly seen in patients with cognitive impairment, have obvious effects on treatment adherence and may cause communication difficulties, including a decreased ability to report adverse effects. For this reason, the use of multiple drugs to treat nondementia illnesses in older adults with dementia might be questionable, even when clearly beneficial drugs are prescribed [12]. These concerns represent a barriers to pharmacological treatment of complex patients with dementia and should be evaluated carefully by prescribing physicians when treating older persons with cognitive impairment [10].

Nursing home residents represent a relevant challenge for prescribing physicians, given the high prevalence of comorbidity and cognitive impairment, as confirmed by the high prevalence of polypharmacy in this population. National surveys in Europe, the United States, and Canada have suggested that prevalence of polypharmacy in long-term setting ranges between 15% and 40% [13–15]. Based on this background, the aim of the current study was to explore prescribing physicians' approach to pharmacological treatment of older adults with advanced cognitive impairment in nursing homes in Europe and Israel. In particular, the current study assesses prevalence, and patient and facility characteristics related to the use of multiple medications in a sample of nursing home residents with advanced cognitive impairment in eight countries participating in the Services and Health for Elderly in Long-Term Care (SHELTER) project.

2. Methods

2.1. Sample and study setting

The SHELTER study enrolled 4156 nursing home residents in 57 facilities from seven countries in the European Union (Czech Republic, England, Finland, France, Germany, Italy, the Netherlands) and one non-European Union country (Israel). The SHELTER study was designed to validate the International Resident Assessment Instrument

(InterRAI) for long-term care facilities (InterRAI LTCF), a comprehensive standardized instrument, as a tool to assess the care needs and provision of care to residents in nursing home in Europe [16].

The study was conducted from 2009 to 2011. In each country, study partners identified a sample of nursing homes willing to participate in the study. The sample was not selected randomly and it was not intended to be representative of all nursing homes in each country. Overall, 57 nursing homes participated to the study (Czech Republic, 10; England, 9; Finland, 4; France, 4; Germany, 9; Israel, 7; Italy, 10; the Netherlands, 4). Older adults residing in participating nursing homes at the beginning of the study and those admitted during the 3-month enrolment period after the initiation of the study were assessed using the InterRAI LTCF. No exclusion criteria were adopted. Residents were invited to take part in the study and were free to decline participation. Ethical approval for the study was obtained in all countries according to local regulations.

2.2. Data sources

The InterRAI LTCF contains more than 350 data elements, including sociodemographic variables, numerous clinical items about both physical and cognitive status, as well as all clinical diagnoses [17,18]. The InterRAI LTCF also includes information about an extensive array of signs, symptoms, syndromes, and treatments being provided. The SHELTER study showed that the InterRAI LTCF is a reliable instrument that enables the creation of databases that can be used to assess and compare characteristics of nursing home residents across countries, languages, and cultures [16].

Study researchers responsible for data collection were trained following a previously validated procedure [19]. In each country, courses were organized to teach study researchers how to assess residents by the InterRAI LTCF, including the specific forms and appropriate response codes, and to develop care planning. Study researchers were trained to use a variety of information sources, such as direct observation; interviews with the person under care, family, friends, or formal service providers; and to review clinical records, both medical and nursing.

2.3. Copy of drug use

Data about all the drugs patients had been taking in the 3 days prior to the assessment were collected by study researchers who gathered information from physician order sheets and medication administration record. Drug information included nonproprietary and proprietary name, anatomic therapeutic and chemical code of the World Health Organization Collaborating Centre for Drug Statistics Methodology [20], formulation, dosage, frequency (number of times per day, week, or month the medication is taken), and route of administration. Drugs with no ingredients that are absorbed