Journal of Nursing
Revista de Enfermagem
UFPE On Line
ISSN: 1981-8963

ORIGINAL ARTICLE

IMPROPER USE OF DRUGS IN ELDERLY RESIDENTS IN A LONG STAY INSTITUTION

USO DE MEDICAMENTOS INAPROPRIADOS POR PESSOAS IDOSAS RESIDENTES EM INSTITUIÇÃO DE LONGA PERMANÊNCIA

USO DE MEDICAMENTOS INAPROPIADOS POR PERSONAS ANCIANAS RESIDENTES EN INSTITUCIÓN DE LARGA PERMANENCIA

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ABSTRACT

Objective: to identify inappropriate drugs consumed by elderly people residing in a Long Term Care Institution, based on the first criterion of Beers-Fick. ***Method***: cross-sectional, descriptive study, with a quantitative approach using secondary data. Study subjects were 39 elderly residents at the institution who used drugs. The data collection period was the first half of 2006. The data were tabulated and processed in an electronic database and processed using descriptive statistics. The drugs were identified as unsuitable for the elderly from the first criterion established by Beers-Fick. ***Results***: 14.7% of the drugs used by the elderly were considered inappropriate: diclofenac, digoxin, chlorpropamide, amiodarone, diazepam, lorazepam, amitriptyline, thioridazine, methyldopa, mineral oil, nitrofurantoin, and fluoxetine. ***Conclusion***: it is expected to raise awareness among health professionals, especially nurses, to promote the rational and careful use of medications to institutionalized elderly. ***Descriptors***: Elderly; Long Term Institution for Elderly; Medicinal Products; Nursing.

RESUMO

Objetivo: identificar os medicamentos impróprios, consumidos por pessoas idosas residentes em uma Instituição de Longa Permanência, tendo por base o primeiro critério de Beers-Fick. ***Método:*** estudo transversal, descritivo, com abordagem quantitativa, que utilizou dados secundários. Foram sujeitos do estudo 39 pessoas idosas residentes na instituição que faziam uso de medicamentos. O período de coleta de dados foi no primeiro semestre de 2006. Os dados foram tabulados e processados em banco de dados eletrônico e tratados pela estatística descritiva. Os medicamentos foram identificados como impróprios às pessoas idosas a partir do primeiro critério estabelecido por Beers-Fick. ***Resultados:*** 14,7% dos medicamentos utilizados pelas pessoas idosas foram considerados impróprios: diclofenaco, digoxina, clorpropramida, amiodarona, diazepam, lorazepam, amitriptilina, tioridazida, metildopa, óleo mineral, nitrofurantoína e fluoxetina. ***Conclusão:*** espera-se sensibilizar os profissionais da saúde, em especial o enfermeiro, a promover o uso racional e cuidadoso de medicamentos para as pessoas idosas institucionalizadas. ***Descritores*****:** Idoso; Instituição de Longa Permanência para Idosos; Uso de Medicamentos; Enfermagem.

RESUMEN

Objetivo: identificar los medicamentos impropios, consumidos por personas ancianas residentes en una Institución de Larga Permanencia, con base el primer criterio de Beers-Fick. ***Método:*** estudio transversal, descriptivo, con enfoque cuantitativo, que utilizó datos secundarios. Fueron sujetos de estudio, 39 personas ancianas que usaban medicamentos residentes en la institución. El período de recolección de datos fue en el primer semestre de 2006. Los datos fueron tabulados y procesados en banco de datos electrónico y tratados por la estadística descriptiva. Los medicamentos fueron identificados como impropios para las personas ancianas a partir del primer criterio establecido por Beers-Fick. ***Resultados:*** 14,7% de los medicamentos utilizados por las personas ancianas fueron considerados impropios: diclofenaco, digoxina, clorpropamida, amiodarona, diazepam, lorazepam, amitriptilina, tioridazina, metildopa, aceite mineral, nitrofurantoína y fluoxetina. ***Conclusión:*** se espera sensibilizar a los profesionales de la salud, en especial al enfermero, a promover el uso racional y cuidadoso de medicamentos para las personas ancianas institucionalizadas. ***Descriptores*****:** Anciano; Institución de Larga Permanencia para Ancianos; Uso de Medicamentos; Enfermería.

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ISSN: 1981-8963 DOI: 10.5205/reuol.8557-74661-1-SM1002201630

INTRODUCTION

The elderly are the most vulnerable group to the problems related to drug use. The high prevalence of non-communicable chronic diseases in the power of the pharmaceutical industry, the marketing of drugs, self-medication, consultation with various experts and medicalization are some of the determinants of high consumption of drugs in the age group over 60 years old, in developing countries and people over 65 years old in developed countries.[1-2]

In different Brazilian cities, it was observed that 82% to 90% of elderly people used at least one medication, demonstrating the high prevalence rates.[3-4] This is associated with the risk of the use of inappropriate medication and the occurrence of adverse effects.[5] The potential implications of such widespread use of drugs are considered major public health problem because they are associated with increased morbidity and mortality among the elderly.

For the elderly, the risks involved in the consumption of drugs are higher when compared to the rest of the population due to the older people have different responses to drugs compared to younger people. This is because the pharmacokinetic and pharmacodynamic changes, characteristic of the aging process, make a most vulnerable population group to drug interactions, side effects, and adverse drug reactions.[6]

In older people, there is decreased muscle mass, body water, and hepatic metabolism; homeostatic mechanisms and the filtration capability and excretion may be compromised. Because of these physiological factors, the elimination and metabolism of drugs are difficult, resulting in an accumulation of toxic substances in the body, which can lead to more severe adverse effects.[2,7]

Since the 1990s, criteria have been proposed to define the inappropriate medications or its use must be evaluated in the elderly. Improper medicine for the utilization of these people is defined as any product whose risks are greater than the benefits. The use of these drugs can be considered as an important cause of problems related to drug therapy in older people or may be responsible for many adverse reactions.[1,2] Thus, it is important to identify these drugs to establish a suitable pharmacological therapy.

Some lists with inappropriate drug names have been proposed by researchers from France, Canada, and the United States. The criterion of Beers-Fick developed in the United States is the most widely used method for evaluating the characteristics of the adverse effects of prescription drugs to the elderly.[2]

The Beers-Fick method was first developed in 1991, based on a study of institutionalized elderly. Beers and collaborators, after a meeting with experts in pharmacology and geriatrics, published the first set of criteria to determine the use of inappropriate drugs in institutionalized elderly people. A list of 30 drugs to be avoided was produced, regardless of diagnosis, the dose, and frequency of use. That list covered psychiatric drugs, antihypertensives, oral hypoglycemic agents, non-steroidal anti-inflammatory drugs and analgesics.[8]

A review of Beers-Fick criteria was published in 1997 to include older people in varying levels of weakness and residents both in the community and in long-term institutions. The potentially inappropriate drugs were classified into three categories: those that should be avoided in older people in general; those expected to maximum doses adjusted for patient´s age; and those that should be prevented in certain diseases.[8]

Fick and collaborators in 2002 published a new list to update drugs and diseases in which the drugs were classified according to two criteria. The first criterion is about medicinal products or their classes that should be avoided in older people, regardless of diagnosis or medical condition due to the high risk of side effects and the existence of other, safer drugs. The second criterion is related to drugs or their classes that should not be used in certain clinical circumstances.[9] The criteria of Beers-Fick are employed around the world, both in clinical practice and in the development of research relevant to the topic.

It is emphasized that the nurse has an ethical, legal and professional responsibility to promote safe care in administering medication to the elderly as well as being the communication link in the health team.[4] Thus, possessing scientific knowledge related to inappropriate medication may contribute to the proper administration of medications, reducing the possible complications in the elderly, justifying this study.

The medication process, prescription, dispensing and administration of drugs involves not only medical and pharmaceutical care but also nursing care in an interdisciplinary perspective. Although there are many studies carried out by nurses in the topic about the use of inappropriate drugs for

the elderly, this topic is shown to be relevant to the nurse, providing subsidies for dialogue with other professionals aimed at health promotion and prevention of comorbidities arising the misuse in older people.

In this understanding, the question is: << What are the inappropriate drugs consumed by elderly people living in long-term care institutions, based on the first criterion of Beers-Fick? >> Thus, the objective is to:

♦ Identify inappropriate drugs, consumed by elderly people living in long-term care institutions, based on the first criterion of Beers-Fick.

METHOD

Cross-sectional, descriptive study, with a quantitative approach, which uses secondary data from the research << Profile of elderly residents in a long-term institution for the Elderly (ILPIs): Proposal of nursing/health action >>, prepared by the Group for Study and Research in Gerontology and Geriatric, Nursing/Health and Education (GEP-GERON).

The base study database had information collected through the form of Multidimensional Assessment of the Elderly, applied to 53 residents of an ILPI, located in the extreme southern city of Brazil in the first half of 2006.

This ILPI had about 80 people, of whom 53 were subjects of the study base. Fifteen older people did not participate in the survey because they have cognitive problems, ten refused to answer the assessment tool and two people were younger than 60 years old, reason excluded from the initial project. For the current research, the theme was the use of drugs for institutionalized elderly, from the 53 subjects of the initial project, those who consumed drugs were selected, having a total of 39 residents.

For data collection, data of interest notes were prepared, consisting identification data: gender, age, marital status and education – know or not know how to read; signals and symptoms; diseases; drug prescription.

The diseases were grouped according to the International Classification of Diseases, 10th edition (ICD-10).[10] The drugs were classified according to the Anatomical Therapeutic Chemical Code (ATCC), established by the Nordic Council on Medicines and recommended by the Drug Utilization Research Group (DURG) of the World Health Organization for studies of medication use.[11] In this classification, they are divided according to the anatomical group or system in which they act and their chemical, therapeutic and pharmacological properties. The Specialty Pharmaceutical Dictionary was used to identify substances from trade names.[12]

Data were tabulated and processed in an electronic database in Microsoft® Excel 2007 program, treated by descriptive statistics. The drugs were identified as improper for the elderly from the first criterion established by Beers-Fick.[9]

The original research was authorized by the President of the institution investigated and it was approved by the Ethics and Research Committee of Health Area of the Federal University of Rio Grande (FURG) under number 42/2005. The elderly have signed or put their fingerprints on the Consent Term.

RESULTS

Among the 39 elderly people who use drugs, 74.4% were female, 51.3% were younger than 80 years old, 74.4% could read, and 56.3% were widowed. Among the self-reported diseases, the highlighted ones were the circulatory system (89.7%), followed by endocrine, nutritional and metabolic diseases (33.3%) and diseases of the musculoskeletal system and connective tissue (28.2%).

Among the 39 elderly who used drugs, the average use was 3.7 drugs per person, ranging from one to 8 and 89.7% of older people were using two or more drugs daily. Among the most consumed therapeutic classes, medicines were acting on the cardiovascular system (35.0%), central nervous system (17.5%) and food and metabolism tract (10.5%). Among the 143 different drugs, it was found that 21 (14.7%) were considered inappropriate drugs for elderly people, according to the first criterion of Beers-Fick. Among the 39 elderly people who used drugs, 13 (33.33%) used improper medication, and out of them, five consumed more than one type of improper drug.

The drugs used in the study, considered improper for the elderly, according to the first criterion of Beers-Fick were: diclofenac, digoxin, chlorpropamide, amiodarone, diazepam, lorazepam, amitriptyline, thioridazine, methyldopa, mineral oil, nitrofurantoin, and fluoxetine. The risks to the health of the elderly associated with the use of each drug are described in Table 1.

Improper medication	Risk for the elderly people
Diclofenac	Gastric bleeding
Digoxin	Increased risk of digitalis toxicity
Chlorpropamide	Prolonged hypoglycemia and syndrome of inappropriate secretion of antidiuretic hormone
Amiodarone	Changes in the QT interval, severe arrhythmias
Diazepam	Sedation, risks of falls and fractures
Lorazepam	Sedation, risks of falls and fractures
Amitriptyline	Sedation, dry mouth, urinary retention, blurred vision, constipation
Thioridazine	Extrapyramidal and central nervous system adverse events
Methyldopa	Exacerbation of depressive disorders, bradycardia
Mineral oil	Aspiration risk
Nitrofurantoin	Renal insufficiency
Fluoxetine	Agitation and sleep disorders

Figure 1. Improper medication for the elderly, consumed by residents of one ILPI, Rio Grande, do Sul, Brazil, 2006

DISCUSSION

Most of the old people using medication, resident in the ILPI investigated were female between 80-89 years old and widow. It was found that the most common factors associated with increased use of medications among the elderly are: being female; being in older age; living without a partner; be resident in ILPI.[13]

Among the self-reported diseases by the elderly of the study, the cardiovascular system was the most frequent and are presented by the most widely used therapeutic class being the drugs that act on the cardiovascular system, data similar to those identified in other studies.[3-4,13-14]

Older people use on average 3.7 drugs/elderly person. The resulting number is similar to a study conducted in communities of Porto Alegre/RS, in which the average of medicines/elderly person was 3.2.[13] However, it was lower than a study with institutionalized elderly with an average of 4.6 drugs/elderly person.[14]

Within the clinic aspect, the combination of medicines is used as a therapeutic strategy for many diseases that are prevalent in the sample, either to achieve the therapeutic objective, or for treating comorbid conditions, and this is what might have occurred in the studied elderly people. However, such combinations may result in adverse events of the medication and causing hospitalization and death, especially when they are associated with potentially related drugs and inappropriate for the elderly.[2]

Among the elderly who used medication, 33.33% used, at least, one inappropriate medication. This data is similar to a study of hospitalized elderly in which 29.2% used inappropriate drugs.[15]

Considering that in the ILPI where the elderly from the study lived, there is the use of medication without a medical prescription, such professionals working with the elderly of the institution need to review the treatment regimens that are prescribing. The prescription for the elderly should contain a simplified treatment regimen with appropriate dosages, and potentially interactive drugs should be replaced, looking for the maximum therapeutic effect with minimal medicines and adverse effects.[16]

Concerning the inappropriate medications, the methyldopa used by two elderly of the research, is an anti-hypertensive belonging to the class of adrenergic inhibitors centrally acting, recognized to trigger adverse reactions such as motor impairment, weakness, fatigue, dizziness, postural hypotension, among other.[17] In older people, the sympathetic inhibition can produce falls by postural hypotension.[18] A study conducted in the north of Teresina/PI showed that 88.1% of the elderly who have suffered falls were using anti-hypertensive drugs.[19]

Amiodarone used by two residents of the ILPI, study scenario, has a high potential for serious adverse reactions in older people. It was identified as the cause of the complete atrioventricular block and second-degree atrioventricular block in elderly hospitalized in São Paulo/SP.[20]

Digoxin, used by three elderly people in the study, is a positive inotropic agent used in heart failure, and it is toxic effects of risk especially for the elderly since this drug appears more susceptible to arrhythmias. This drug, having an Increased half-life and reduced excretion in the elderly, is inappropriate when its dose is greater than 0.125 mg by the risk of digitalis toxicity.[2,9] The researched elderly have used this drug in inappropriate doses (greater than 0.125 mg).

Chlorpropamide used by one elder of the study may predispose individuals in this age group leading to hypoglycemia and syndrome of inappropriate secretion of antidiuretic hormone. These adverse events increase the risk of acute myocardial infarction, stroke, and fall in older people.[1-2]

The nitrofurantoin, which has its use contraindicated because of the risk of causing kidney failure in elderly was used by a resident of the ILPI of the study. This drug has been identified as causing serious adverse reaction in a study of elderly hospitalized in São Paulo/SP.[20]

Among the nonsteroidal anti-inflammatory drugs (AINEs) diclofenac, used for two elderly of the study is considered improper for this age group, as the use risks are greater than the benefits. It can cause adverse reactions, such as gastric irritation and ulcers and nephrotoxicity and have the clinical consequences of hemorrhage, anemia, renal insufficiency, and sodium retention.[1-2]

Diazepam, which was used for three elderly and lorazepam by one, belong to the therapeutic class of benzodiazepines, which is contraindicated in elderly people use. These drugs can cause adverse reactions with clinical consequences as falls with hip fractures, impaired memory, and confusion. Studies indicate that benzodiazepine consumption is high among the elderly and that many of these people end up being dependent on this type of medicine.[21]

The thioridazine, an antipsychotic drug that was used by an elder of the study, it is considered inappropriate for the elderly because it can cause adverse reactions such as sedation, late dyskinesia, reduced anticholinergic effects, and dystonia. These reactions may present as clinical consequences fall with fractures, confusion, and social isolation.[1]

The amitriptyline and fluoxetine, both antidepressant drugs are considered inappropriate, and they were used for four elderly of the study. In amitriptyline, anticholinergic effects, such as reduced motility of the gastrointestinal tract, dry mouth, bladder hypotonia, blurred vision and orthostatic hypotension are higher than those of other tricyclic antidepressants in older people. It can also cause sedation, which can lead to falls. Fluoxetine, a selective inhibitor of serotonin, may result in stimulation of the central nervous system causing agitation and sleep disorders.[1-2,9]

Mineral oil was used by one elder of the study. It is considered inappropriate for the elderly because of the risk of aspiration.[9] Microaspiration of lipid substances can lead to lipoid pneumonia. The cases described in this pneumonia have been linked to the therapeutic use of mineral oil as a laxative for the elderly with chronic constipation.[22]

Besides being considered unsuitable for the elderly, drugs such as digoxin, amiodarone, amitriptyline, fluoxetine, diazepam, lorazepam, thioridazine and AINEs used by elderly people in the study are potentially interactive, which increases the risk to occur adverse events associated with the use of medication in these individuals. It should be noted that five elderly in the study consumed more than an improper drug at the same time, increasing the risks.

In 2008, a study to validate the use of the Beers-Fick criteria in Brazil looked at the list of generic drugs, published in the Federal Official Gazette on July 12, 2004. Of the total medicines of that list, 6.7 % were considered inappropriate for elderly, and Beers-Fick criteria were considered valid to identify the use of inappropriate drugs to this population in the country.[8]

The same study points out that these criteria do not aim to all situation involving the inappropriate use of medications in the elderly in Brazil. A common use of drugs in the country as cough suppressants, cinnarizine, diltiazem, piracetam, quinolones, xanthines, creams, ointments and eye drops found on the list of generic drugs, must be carefully prescribed to people over 60 years old according to clinical criteria. This information has not been reported in several of the bulls nor cited the criteria of Beers-Fick. An example is the pharmacological action of certain eye drops, potential triggers of cardiovascular disorders and psychiatric disorders in older people who have been deleted from the bulls.[8]

Considering the need to update periodically, the Beers-Fick criteria are useful for preventing the use of potentially inappropriate drugs because they are easy to remember and usable in multiple languages.[8]

CONCLUSION

This study is considered satisfactory since it was possible to identify the inappropriate drugs, consumed by elderly people residing in a Long-term care Institutions, based on the first criterion of Beers-Fick. The study found that 14.7% of the drugs used by the elderly residents of ILPI were considered inappropriate. They were: diclofenac, digoxin, chlorpropamide, amiodarone, diazepam, lorazepam, amitriptyline, Thioridazine,

methyldopa, mineral oil, nitrofurantoin, and fluoxetine.

A limitation of this study is that the data has been collected by others, not by the main researcher since they were taken from a database of a group of study and research. This situation guides for further studies related to the consumption of drugs for institutionalized elderly.

It is believed that the topic may have an impact on the views of health professionals and society as it shows the effective contribution regarding the care of the elderly, especially those related to the use of medications. It is expected that this data will contribute to the science of nursing/health on the understanding of care for the elderly and provide support for dialogue between the professionals who assist these people for the promotion of health and prevention of comorbidities resulting from the inappropriate use of medications.

Studies conducted show the reality of institutionalized elderly and tend to raise awareness among health professionals, with emphasis on the nurse, to promote the rational and careful use of drugs for these people. It is believed that the nurse possessing scientific knowledge about the inappropriate drugs consumed by older people can get acquainted with the health team and participate in an interdisciplinary way in the care to this group to promote health and prevention of comorbidities resulting from improper use.

This topic is not limited to this study, and many opinions may arise when reviewing the data presented. It is considered of utmost importance a new research to be conducted on this theme. The study can be carried out to relate the use of inappropriate medications for older people with the incidence of comorbidities described in the table on the results of this research.

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Submission: 2014/09/11
Accepted: 2016/01/10
Publishing: 2016/02/01

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