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Drug profile and frequency of polypharmacy in elderly people in a Basic Health Unit

Perfil medicamentoso e frequência de polifarmácia em idosos de uma Unidade Básica de Saúde

Perfil farmacológico y frecuencia de polifarmacia en ancianos en una Unidad Básica de Salud

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ABSTRACT

Objective: to identify the medication profile and frequency of polypharmacy in registered elderly people who are followed up at a primary care unit. **Method:** observational and retrospective study, carried out in a primary care unit in a municipality in Triângulo Mineiro, Minas Gerais. Random and stratified sampling was carried out to collect data from the physical and electronic medical records of the elderly assisted in the years 2019 and 2020, analyzed using descriptive statistics. **Results:** among 448 medical records analyzed, 208 (46.4%) were considered valid for inclusion in the study. The most prescribed drugs were losartan (n=72; 34.6%), simvastatin (n=60; 28.8%) and metformin (n=51; 24.5%). There was a 24.0% frequency of polypharmacy (n=51), a higher frequency of wome (n=42; 30.2%) and with a significant association with diabetes mellitus (p=0.034). **Conclusion:** polypharmacy was detected, more present in women, and the most used drugs were related to arterial hypertension, dyslipidemia and diabetes mellitus. The incompleteness of information in the analyzed medical records stands out.
Descriptors: Health of the Elderly; Aged; Primary Health Care; Polypharmacy.

RESUMO

Objetivo: identificar o perfil medicamentoso e a frequência de polifarmácia em idosos cadastrados e que fazem acompanhamento em uma unidade básica de saúde. **Método:** estudo observacional e retrospectivo, realizado em uma unidade básica de saúde de um município do Triângulo Mineiro, Minas Gerais. Foi realizada amostragem aleatória e estratificada para coleta de dados de prontuários físicos e eletrônicos de idosos atendidos nos anos de 2019 e 2020, analisados por meio de estatística descritiva. **Resultados:** entre 448 prontuários foram analisados, porém somente 208 (46,4%) foram válidos. Os medicamentos mais prescritos foram losartana (n=72; 34,6%), sinvastatina (n=60; 28,8%) e metformina (n=51; 24,5%). Observou-se 24,0% de frequência de polifarmácia (n=51), maior frequencia de mulheres (n=42; 30,2%) e com significativa associação com diabetes mellitus (p=0,034). **Conclusão:** a polifarmárcia foi detectada, mais presente nas mulheres, sendo que medicamentos mais utilizados foram relacionados à hipertensão arterial, dislipidemias e diabetes mellitus. Destaca-se a incompletude de informações nos prontuários analisados.
Descritores: Saúde do Idoso; Idoso; Atenção Primária à Saúde; Polimedicação.

RESUMEN

Objetivo: identificar el perfil farmacológico y frecuencia de polifarmacia en ancianos registrados en seguimiento en una unidad básica de salud. **Método:** estudio observacional y retrospectivo, realizado en una unidad básica de salud de un municipio del *Triângulo Mineiro*, Minas Gerais. Se realizó un muestreo aleatorio y estratificado para recolectar datos de las historias clínicas físicas y electrónicas de los ancianos atendidos en los años 2019 y 2020, analizados mediante estadística descriptiva. **Resultados:** de 448 historias clínicas analizadas, 208 (46,4%) fueron consideradas válidas para su inclusión en el estudio. Los fármacos más prescritos fueron Losartán (n=72; 34,6%), Simvastatina (n=60; 28,8%) y Metformina (n=51; 24,5%). La frecuencia de polifarmacia estuvo en el 24,0% (n=51), mayor frecuencia de mujeres (n=42; 30,2%) y con asociación significativa con diabetes mellitus (p=0,034). Conclusión: se detectó la polifarmacia, más presente en las mujeres; los fármacos más utilizados estuvieron relacionados con hipertensión arterial, dislipidemia y diabetes mellitus. Se destaca la incompletitud de la información en las historias clínicas analizadas.
Descriptores: Salud del Anciano; Anciano; Atención Primaria de Salud; Polifarmacia.

INTRODUCTION

The broad base of the population pyramid is the result of an aging population, reflecting a reduced participation of children and adolescents and a proportional increase of adults and aged people. The inversion of the age pyramid is characterized by a reduction in the mortality rate of the long-lived population and a decrease in the fertility rate, consequently generating an increase in the life expectancy of these individuals[1]. The growth rate corresponding to this population group was 4% per year during the 2012-2022 period. It is estimated that by 2060, 25.49% of the Brazilian population will be comprised by people aged over 60 years old[2].

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Due to the significant increase in the number of aged people in the country, it becomes necessary to identify and understand the weaknesses that this population is susceptible to in order to direct and offer good quality care[3].

That said, Primary Health Care is considered the gateway to the Unified Health System (*Sistema Único de Saúde*, SUS), enabling continuous and comprehensive care, whether individual or collective, providing autonomy and co-responsibility for the assistance to be provided, respecting the specificities of the geriatric population in addition to making them protagonists of care[4,5]. The units are organized territorially and care is provided to the individuals from the attached area served by that Family Health Strategy (FHS)[5].

Aging is a natural process that all individuals are subjected to; it is inconvertible, progressive and heterogeneous, as each person goes through it in a different way. Due to this process, several changes occur in the body of an aged person, especially those related to a greater probability of developing chronic diseases, which are oftentimes treated with simultaneous use of several prescribed medications, leading to increased drug consumption by this age group[6,7].

Within these physiological changes there are those related to the pharmacokinetics and pharmacodynamics of the medications in use, in which there is a change in the speed at which the drug will be absorbed and excreted by the body, affecting duration of its effect in the aged patient[8].

Polypharmacy is the simultaneous use of five or more medications and intensifies the chances of adverse drug reactions (ADRs), difficulty in therapeutic adherence, drug interactions and increased health-related expenses[7,9-11].

Considering the increase in the aged population, its susceptibility to chronic diseases and medication use, the current study aimed at identifying the medication profile and polypharmacy frequency in registered aged people monitored at a Basic Health Unit.

METHOD

This study had a quantitative approach and was of an observational and retrospective nature, guided by the *Strengthening the Reporting of Observational Studies in Epidemiology* (STROBE) tool. It was carried out in a Basic Health Unit (BHU) from a municipality located in the Southern Triangle of Minas Gerais, comprised by three Family Health Strategies (FHS), where reception and screening of the population demands are carried out by the Nursing team, with the help of health agents. General and Gynecology clinical medical care is offered, in addition to Dentistry and Psychology services.

A survey was carried out of patients who underwent consultations at the health unit in question in 2019 and 2020, whose inclusion criteria were medical records of aged people aged at least 60 years old, registered and treated at the unit between January 2019 and December 2020. Subsequently, a database was created in which a population of 1,634 records was identified and 448 medical records of aged people were selected through stratified and randomized sampling.

A structured form was created for data collection, evaluated by three judges specialized in the area. After the suggestions were accepted, the diverse information on the form contained closed questions about the sociodemographic and clinical profile, such as: gender, age, race/ethnicity, profession/occupation, marital status, neighborhood where the participant lives, schooling level, chronic diseases (diagnoses) and/or comorbidities; and open questions to list the continued use medications of each research participant.

Data collection was carried out at the aforementioned BHU from March to May 2021 by Nursing residents from a Federal University who worked there, who received prior training from the advisor for standardization of the collection procedure, developed with physical and electronic medical records, retrospectively to 2019 and 2020. After filling in the forms, the data were tabulated in an Excel spreadsheet by means of double-typing.

Data analysis was performed via descriptive statistics, with the variables analyzed by means of absolute and relative frequencies. Fisher's Exact Test was used to investigate associations between polypharmacy and comorbidities, considering a significance level of $p<0.05$.

The research protocol was approved by the Research Ethics Committee (*Comitê de Ética em Pesquisa*, CEP) in compliance with Resolution No. 466/12, waiving free and informed consent.

RESULTS

A total of 448 medical records were analyzed. Of these, there prevalence of medical records corresponding to aged women (n=275; 61.4%), white-skinned (n=264; 58.9%), retired (n=173; 38.6%), married or living with a partner (n=140; 31.3%) and with incomplete Elementary Education (n=139; 31.0%). Of the total, 337 older adults had at least

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one comorbidity (75.3%), the most frequent being: systemic arterial hypertension (SAH) (n=293; 65.4%), diabetes *mellitus* (DM) (n=125; 27.9%), obesity (n=43; 9.6%), heart disease (n=33; 7.4%), hypothyroidism (n=26; 5.8%) and dyslipidemia (n=20; 4.5%). The characteristics corresponding to the medical records analyzed are presented in Table 1.

TABLE 1: Characteristics corresponding to the medical records of older adults in a BHU (n=448). Minas Gerais, MG, Brazil, 2020.

Medical records	n	%
With a physical and/or electronic medical record	241	53.8
No physical medical record	82	18.3
No electronic medical record	43	9.6
No physical or electronic medical record	38	8.5
Blank medical record	31	6.9
Outdated data	2	0.4
Death	11	2.5
Total	448	100.0

While investigating the medical records, it was observed that 207 (46.2%) had absent physical medical records, without electronic medical records, without both types of medical records, blank medical records, outdated data or deaths. In the sample analyzed, 240 medical records (53.6%) were lost due to lack of information on prescription and/or use of medications by the older adults assisted in the 2019-2020 period. Therefore, of the 448 records, 208 (46.4%) were considered valid for containing such information. Table 2 presents the identified prescription drugs.

TABLE 2: Medications prescribed in medical records of older adults in a BHU (n=208). Minas Gerais, MG, Brazil, 2020.

Medications	n	%
Losartan Potassium	72	34.6
Simvastatin	60	28.8
Metformin Hydrochloride (Glifage XR)	51	24.5
Hydrochlorothiazide	51	24.5
Acetylsalicylic Acid	42	20.2
Levothyroxine Sodium	37	17.8
Clonazepam	28	13.5
Atenolol (Ablock)	27	13.0
Omeprazole	26	12.5
Amlodipine	19	9.1
Fluoxetine hydrochloride	19	9.1
Cholecalciferol	14	6.7
NPH Insulin	14	6.7
Amiodarone Hydrochloride	13	6.3
Amitriptyline Hydrochloride	13	6.3
Furosemide	13	6.3
Enalapril Maleate	13	6.3
Carvedilol	12	5.8

Considering the 208 medical records with such information (46.4%) and that some patients used more than one medication, losartan and carvedilol were the most and least prescribed in this sample, respectively.

The occurrence of polypharmacy is shown in Table 3.

Table 3: Presence of polypharmacy among older adults in a BHU (n=208). Minas Gerais, MG, Brazil, 2020.

Polypharmacy	Total n (%)	Female n (%)	Male n (%)
Absent (up to 4 medications in use)	157 (75.5)	97 (69.8)	60 (87.0)
Present (5 or more medications in use)	51 (24.5)	42 (30.2)	9 (13.0)

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When observing all 208 medical records, it was possible to verify that 51 (24.5%) older adults treated between 2019 and 2020 in the aforementioned BHU made use of five or more medications, representing presence of polypharmacy; in addition, in the distribution between the genders, it can be seen that polypharmacy was more frequent among females.

In order to establish possible associations between polypharmacy and comorbidities, it was also detected that, of the 448 medical records analyzed, only 96 presented information on both aspects (21.4%). The comorbidities investigated were the following: SAH, DM, obesity, heart disease, hypothyroidism and dyslipidemia, and Fisher's Exact Test only identified significance in the association between diabetes *mellitus* and polypharmacy (p=0.034).

DISCUSSION

It can be stated that the feminization of old age is related to the higher number of aged women in relation to that of aged men, and such phenomenon is linked to the demographic transition[12]. The Unified Health System Informatics Department (DATASUS) presents a simple projection of the Brazilian population by gender and age in the period from 2019 to 2020, which shows that, in the age groups of 60 years or more, the ratio of aged women is higher than that of aged men, which corroborates the study finding[13]. Such problem is relevant in the entire national territory, as presented below in this discussion.

The sociodemographic profile corroborates the findings of a research study carried out in two basic health units from the city of Franca (SP), where most of the older adults interviewed were female (n=139; 68.13%), of white ethnicity (n=111; 54.41%), married (n=93; 45.58%) and living with family members (n=160; 78.43%)[14].

In a study conducted in northeastern Brazil, 60.7% prevalence of female participants (n=2,059) and 79.5% of retired individuals (n=2,699) was noticed. However, the brown race predominated in terms of ethnicity (n=1,866; 55%)[15]. In a population-based study carried out in Brazil, prevalence of aged people with multicomorbidities associated with some variables was noticed, with female gender and longer-lived aged individuals as the most prevalent[16].

In a study carried out in sixteen family health units from the city of São Carlos (SP), prevalence of chronic non-communicable diseases (CNCDs) was noticed and that they are more prevalent in the aged population[5]. Older adults have risk factors that potentiate the onset of CNCDs, as highlighted in a study carried out in Franca, São Paulo (SP), where the results show that the risk factors are concentrated as follows: in sedentary people, in those with a Body Mass Index (BMI) above 25 kg/m², in people on a high-fat diet, a diet low in vegetables, fruits and greens, and in those who make frequent use of alcohol and/or tobacco[14].

Oftentimes, these individuals have more than one CNCD, which leads to using multiple drugs[7,17], where five or more medications in use is categorized as polypharmacy. Such use can result in adverse drug reactions, drug interactions and/or iatrogenic cascades, that is, in addition to the abundant use of drugs, there may be excess or omission of interventions or treatments. Polypharmacy is related to the age factor, with higher incidence in older adults aged up to 70 years old, as well as to the number of associated chronic diseases[17].

Among the chronic diseases that most affect older adults, studies carried out in Spain[7], Franca (SP)[14] and Campina Grande (PB)[18] highlighted systemic arterial hypertension, diabetes *mellitus* and dyslipidemia, corroborating the data found in this research.

In addition, a study developed in eight municipalities from a Minas Gerais micro-region[19] described behaviors and health conditions of aged people with and without SAH and detected those hypertensive older adults presented better health behaviors related to alcohol consumption but worse health conditions related to abdominal circumference and number of morbidities, being three times more likely to have five or more morbidities (p<0.001) than non-hypertensive individuals. The same situation can be observed in the state capital city, with the older adults' medication profiles not in line with the most prevalent CNCDs[17].

Studies carried out in the north and northeast regions of Brazil also show the predominance of AH, heart disease and DM[20-22], with oral hypoglycemic agents, antihypertensives and hypolipidemic agents prescribed[21], including losartan and hydrochlorothiazide[20]. In addition, the literature describes as factors associated with the occurrence of polypharmacy, the female gender, age above 75-80 years20,21 and being widowed[20].

The occurrence of polypharmacy identified in the older adults included in this research (24.5%) is also close to the study carried out in the Primary Health Care network of Passo Fundo (RS), which found a rate of 33% (n=403)[23].

Similar data are found in international studies, such as in Thailand, where 27.5% prevalence was observed (n=2,806)[24]. However, in Italy, older adults aged over 75 years old (n=579; 13.4%) were undergoing therapy with eight or more medications[25].

Alarming results were found in Spain, whose analysis of electronic health records corresponding to 916,619 aged individuals found a 49.9% rate for polypharmacy[7], and in China, which evaluated a total of 19,332 aged people with

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hypertension as comorbidity, with a 50.5% rate of polypharmacy, being higher in older adults over the age of 80. However, the study highlights that the polypharmacy rates among the older adults that sought treatment in the community health centers were low[9]. In other words, aged individuals who undergo monitoring use fewer medications indiscriminately.

Regarding the distribution of polypharmacy and gender, in the national scenario, a study carried out at two BHUs in Belo Horizonte (MG) corroborates the findings that the aged female population (n=94; 58.4%) is more susceptible to using five or more drugs[17], as the older female population has more comorbidities when compared to the male gender, in addition to seeking health services more[16].

However, gender did not exert a significant effect on polypharmacy distribution in the studies conducted in China[9] and in Italy[25].

Study limitations

As limitations, it is noted that most of the medical records randomized and analyzed in this study were incomplete, outdated or had missing data. Such limitations interfere in the survey of real data about the profile of the aged population from the region in question, in addition to precluding more complex analyses.

CONCLUSION

In relation to the medication profile, the medications most frequently used by the older adults were related to systemic arterial hypertension, dyslipidemias and diabetes *mellitus*. Presence of polypharmacy was detected among older adults, being more frequent in women and with a significant association between polypharmacy and diabetes *mellitus*.

The study contributes to identifying the occurrence of polypharmacy in aged people, aiming to direct the health professionals' attention to this population, in order to establish strategies and actions for older adults with CNCDs using several medications, allowing to determine possible side effects and/or or drug interactions and then provide guidelines to minimize them.

There is a need to raise awareness about the importance of completing information in older adults' care, as well as about training health professionals through permanent education actions for feeding and updating data from medical records of clients treated in health units.

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Conceptualization, G.G.S. and A.C.N.; methodology, G.G.S. and A.C.N.; software, A.C.N.; validation, G.G.S., I.A.G.P. and M.D.C.; formal analysis, A.C.N.; investigation, G.G.S., I.A.G.P. and M.D.C.; data curation, G.G.S., I.A.G.P. and M.D.C.; writing - manuscript preparation, G.G.S.; writing – review and editing, A.C.N.; visualization, G.G.S., I.A.G.P., M.D.C. and A.C.N.; supervision, A.C.N.; project management, A.C.N. All authors have read and agreed to the published version of the manuscript.