

The tenuous relationship between polypharmacy and iatrogenics in the elderly patient of diabetes mellitus and/or hypertension

A tênue relação entre polifarmácia e iatrogenia no idoso portador de diabetes mellitus e/ou hipertensão

Relación tenue entre polifarmacia e iatrogénica en el paciente mayor de diabetes mellitus y / o hipertensión

RESUMO

Ao considerar a mudança no viés epidemiológico brasileiro, com um aumento da expectativa de vida e redução da taxa de natalidade, é imprescindível dar enfoque em relação à polifarmácia, já que esta afeta cerca de 60% do número de idosos. Objetivo: estimar a prevalência do diabetes mellitus e hipertensão arterial sistêmica, em tratamento com múltiplos fármacos. Ademais, verificar a possibilidade de interações medicamentosas e a presença de iatrogenia. Método: realizou-se entre fevereiro e março de 2021 uma análise especulativa com o levantamento de dados quantitativos a partir de prontuários disponíveis de cerca de 50% dos idosos pertencentes ao grupo Hiperdia da Unidade Básica de Saúde Pinheiros/Maringá-PR. Resultados: determinou-se a quantidade de idosos em polifarmácia e medicamentos mais utilizados, além de abordar as patologias concomitantes. Conclusão: observou-se a contribuição da polifarmácia para com a cascata iatrogênica, reforçando a importância do uso racional de medicamentos para uma adesão efetiva ao tratamento proposto.

DESCRIPTORES: Tratamento farmacológico; Senilidade; Interação medicamentosa.

ABSTRACT

When considering the change in the Brazilian epidemiological bias, with an increase in life expectancy and a reduction in the birth rate, it is essential to focus on polypharmacy, as it affects around 60% of the number of elderly people. Objective: to estimate the prevalence of diabetes mellitus and systemic arterial hypertension, under treatment with multiple drugs. Furthermore, to verify the possibility of drug interactions and the presence of iatrogenics. Method: between February and March 2021, a speculative analysis was carried out with the collection of quantitative data from available medical records of about 50% of the elderly belonging to the Hiperdia group of the Pinheiros/Maringá-PR Basic Health Unit. Results: the number of elderly people in polypharmacy and most used medications was determined, in addition to addressing the concomitant pathologies. Conclusion: the contribution of polypharmacy to the iatrogenic cascade was observed, reinforcing the importance of the rational use of drugs for effective adherence to the proposed treatment.

DESCRIPTORS: Pharmacological treatment; Senility; Drug interaction.

RESUMEN

Al considerar el cambio en el sesgo epidemiológico brasileño, con un aumento de la esperanza de vida y una reducción de la tasa de natalidad, es fundamental centrarse en la polifarmacia, ya que afecta a alrededor del 60% del número de ancianos. Objetivo: estimar la prevalencia de diabetes mellitus e hipertensión arterial sistêmica, en tratamiento con múltiples fármacos. Además, verificar la posibilidad de interacciones medicamentosas y la presencia de iatrogénicos. Método: entre febrero y marzo de 2021 se realizó un análisis especulativo con la recolección de datos cuantitativos de las historias clínicas disponibles de alrededor del 50% de los ancianos pertenecientes al grupo Hiperdia de la Unidad Básica de Salud Pinheiros / Maringá-PR. Resultados: se determinó el número de ancianos en polifarmacia y medicamentos más utilizados, además de atender las patologías concomitantes. Conclusión: se observó el aporte de la polifarmacia a la cascata iatrogénica, lo que refuerza la importancia del uso racional de los fármacos para la adherencia efectiva al tratamiento propuesto.

DESCRIPTORES: Tratamiento farmacológico; Senilidad; Interacción farmacológica.

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INTRODUCTION

Aging is a natural process, characterized by morphofunctional changes that lead to the appearance of several comorbidities, among them arterial hypertension and diabetes mellitus.¹ In this context, in an analysis of the 8 most prevalent chronic diseases evaluated in the Brazilian population, 74% of the elderly reported having at least one disease and 93% used at least one continuous medication. Thus, advanced age is one of the main risk factors for the use of multiple drugs, resulting in a higher incidence of adverse effects that can be avoided with the rational use of drugs and also with an interprofessional approach that provides information necessary to obtain greater therapeutic adherence.²

Arterial Hypertension (AH), popularly known as “high blood pressure”, is defined by blood pressure levels above 140/90 mmHg and represents a potential risk for the development of cardiovascular diseases.³ According to data from the 2019 National Health Survey, 24% of the individuals interviewed claimed a diagnosis of hypertension, which is the most frequent among chronic diseases, with 38.1 million people in this condition. When considering its late diagnosis due to its relatively asymptomatic course, it is worth emphasizing the importance of medication adherence for clinical efficacy and lower cost.⁴ These are related both to an overload of the Health System and to the consequences for the elderly, from their incapacity to the expense of excessive examinations and consultations.⁵ In addition, type 2 diabetes mellitus (DM2), comprised of persistent hyperglycemia due to failure in insulin action and/or secretion⁶ represents an important factor in the

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aging process, considering that 26% of individuals over 65 are sensitized. Based on the fact that its origin is multifactorial, DM2 causes a decrease in the quality of life of this population, as patients have higher rates of premature death, functional disability and other coexisting diseases. Furthermore, it appears that there is a greater number of medical consultations, lower rates of regular practice of physical activity and a worse self-perception of health within the group of people who are carriers and who use various medications.⁷

These two dysfunctions, associated with advanced age, end up leading to a practice known as polypharmacy (PP), in which the person makes excessive and inappropriate use of four or more drugs. This exercise is done due to non-evidence-based treatments, the adoption of combinations with potential drug interactions, and the pharmacological treatment of side effects produced by other drugs. Thus, the last cause is the most important, as it is responsible for the iatrogenic cascade that leads to a greater number of medical consultations and the performance of procedures to treat complications arising from the use of other medications.⁸ In contrast, according to the elderly's dependence on a large amount of medication, the presence of a stressor is indeed related to polypharmacy. However, it appears that the amount of medication administered is not, in fact, as significant on the quality of life of the elderly as the need for several daily doses. Thus, the frequency of use of each medication in a single day was taken as an objective indicator of depression and that also contributes to an iatrogenic process.⁹ Within this context, the present study aims to demonstrate the prevalence of DM2 and arterial hypertension in individuals over 60 years of age who

are in polypharmacy. Furthermore, we seek to assess which drugs are most used for the treatment of these diseases, and their side effects. In this way, aiming to identify health problems in the elderly population, diagnosed with DM2 and AH, related to the use of polypharmacy and thus establish strategies for early identification, prevention and reduction of complications of this practice.

METHOD

In compliance with all the ethical precepts of research, this project was first sent for authorization of the site and for consideration by the CEP – UNICESUMAR, nº CAAE: 39411920.4.0000.5339.

The research is characterized by a retrospective, cross-sectional, descriptive study, with stratified proportional sampling of the elderly carried out at the Pinheiros Basic Health Unit (UBS Pinheiros), in the city of Maringá - PR. For this study, as an exclusion criterion,

people of both sexes were selected, aged 60 years or older, with a confirmed diagnosis of SAH and/or DM2, regardless of the date of diagnosis, residing in urban areas and undergoing health follow-up at their reference UBS. The sample number was determined through the survey of all the elderly of the selected UBS and who fit the research and of these, approximately 50% of the population were investigated. The research public corresponds to a total population of 410 patients who are followed up with the Hiperdia group of the UBS, after sampling, a number of 170 patients were obtained to be evaluated.

Data were collected, after acceptance by the Unicesumar ethics committee and the research site, from February to March 2021. The choice of medical records for data analysis was carried out through a simple random drawing. Only the medical records that were filled in with all the information necessary for the research were analyzed. The data were recorded in a collection instrument produced by the researchers and contains the variables: sociodemographic (sex, age), clinical (medical diagnosis, clinical

events, medical complaints and clinical evolution) and therapeutics (pharmacotherapy used, number of drugs administered, time of drug use, self-medication if any). All medical records were coded to avoid identifying individuals. The collected data were analyzed by Pearson's chi-square test

together, corresponding to 58% of cases. Among the 170 elderly participants in the research, there is a percentage rate of 61% female and 39% male. As for the age group, in which the elderly were found, 44% are between 70-79 years and 41% between 60-69 years, and the minority fits in the age group of 80 years or more. Regarding evidence of the use or not of polypharmacy, there is a total of 69% who use more than 4 medications, including both men and women in this group. In the investigation of other associated comorbidities in addition to hypertension and/or diabetes, only a few patients had a confirmed and explicit diagnosis in their medical records, thus explaining that there is no standardization in sampling in relation to these data. In this same context, it was possible to group the main conditions present among the elderly, hypothyroidism corresponds to 16% of diagnoses, and generalized anxiety disorder corresponds to 10%, these being the largest. The other disorders found, to a lesser extent, are varicose veins, dementia, lung diseases, depressive/mood disorders and bone/joint diseases.

In general, as for the most used medications, and of continuous use, discussed in Table 2, there is Hydrochlorothiazide (51%) and Losartan (58%), followed by Simvastatin (39%), Metformin (34%), Acetyl Salicylic Acid (24%), Enalapril (17%). It is important to highlight the presence of tricyclic antidepressants (Amitriptyline) and serotonin reuptake inhibitors (Fluoxetine) in the list of most used drugs, which calls attention and leads to questioning the incidence, especially of anxious and depressive symptoms in these patients. The high rate of use found in medications that exceeds the total value of 100% is linked to the fact that most individuals use more than 1 medication.

DISCUSSION

In agreement with the data obtained in other studies, SAH is more frequent among cardiovascular diseases, and in Brazil they have a prevalence of around 50% of the population. Especially when associated,

When considering its late diagnosis due to its relatively asymptomatic course, it is worth emphasizing the importance of medication adherence for clinical efficacy and lower cost.

and placed in graphs and tables.

RESULTS

In line with the data obtained, as shown in Table 1, it is possible to evidence a majority pattern among elderly people with hypertension. The other highest percentage observed in the table fits between patients with hypertension and diabetes

SAH and DM are relevant causes of morbidity and mortality, with a higher risk of kidney disease, coronary heart disease, stroke and heart failure. In addition, studies show that the prevalence of hypertension is twice as high in patients who have diabetes as in non-diabetic patients, and the cardiovascular risk is about four times higher in patients with both diseases. 10 Corroborating table 1, there is a higher prevalence of thyroid diseases in patients with DM, which suggests that the metabolic alterations found in diabetic patients interfere with the hypothalamic-pituitary-thyroid axis.¹¹

It was possible to observe that polypharmacy is quite frequent and often unavoidable, especially in individuals who have diabetes mellitus and hypertension concomitantly, as these comorbidities require the use of drug combinations for the management of various health changes resulting from these pathologies.¹² For the treatment of hypertension, the use of hydrochlorothiazide, which is a thiazide diuretic, was very frequent among the groups studied, being one of the first options of choice for the treatment of SAH, as it reduces cardiovascular morbidity and mortality. Among the known side effects, weakness, cramps, hypovolemia and erectile dysfunction deserve to be highlighted. In addition, there is evidence that diuretics can cause glucose intolerance by reducing insulin release, increasing the risk of developing type 2 DM,

which deserves attention, given the large number of participants diagnosed only with hypertension and who are treated with the use of diuretics. In addition, losartan, which is an angiotensin II AT1 receptor blocker, is also widely used, but does not have such significant side effects. Angiotensin-converting enzyme (ACE) inhibitors are also widespread, highlighting Enalapril in this research. This, in turn, has the worrying adverse effect of hyperkalemia, especially when used in diabetic patients with compromised renal function. In addition, beta-blockers such as atenolol were present in this research, which has bronchospasm, bradycardia, atrioventricular conduction disorders, peripheral vasoconstriction, insomnia, nightmares, psychological depres-

Table 1 - Characterization of the percentage of elderly people with diabetes and/or hypertension – Maringá - PR, 2020.

VARIABLES	F(%) Frequency
Age	
60-69 y/o	69 (0,41)
70-79 y/o	75 (0,44)
80-89 y/o	24 (0,14)
90 years or more	2 (0,01)
Sex	
Female	104 (0,61)
Male	66 (0,39)
Presence of Chronic Disease	
Only Hypertension	100 (0,59)
Only Diabetes	12 (0,07)
Hypertension and Diabetes	58 (0,34)
Evidence of use or not of polypharmacy	
Women	72 (0,42)
Men	45 (0,27)
Women using < 4 medications	32 (0,19)
Men using < 4 medications	21 (0,12)
Associated comorbidities	
Hypothyroidism	28 (0,16)
Generalized Anxiety Disorder	17 (0,10)
Varicose veins	6 (0,04)
Dementia	3 (0,02)
Pulmonary diseases	3 (0,02)
Depressive/mood disorders	5 (0,03)
Bone/joint diseases	5 (0,03)
TOTAL	170 (1,00)

Source: Researcher data, 2021.

sion, asthenia and sexual dysfunction can also cause glucose intolerance, induce the appearance of new cases of DM, hypertriglyceridemia with elevation of LDL-cholesterol and reduction of the HDL-cholesterol fraction.¹³ Therefore, it is inferred that the medications to be chosen for the treatment of isolated arterial hypertension need to be adopted cautiously, as the drug side effects can lead to the emergence of new pathologies secondary to the treatment. Furthermore, simvastatin was also strongly present in the continuous use of the evalua-

ted patients, but this in turn has negligible collateral damage, such as gastrointestinal intolerance, nausea and headache.

For the treatment of Diabetes, most patients use Metformin, which is a biguanide of first choice for not very decompensated T2DM cases. It has as common adverse effects gastrointestinal tract disorders (vomiting, nausea, diarrhea and abdominal pain), taste disturbances, and less frequently lactic acidosis, decreased absorption of vitamin B12, erythema, pruritus, urticaria and changes in liver function.¹⁴ Gliclazide was

another very frequent medication, because with better tolerability, lower risk of hypoglycemia and reduced interaction with calcium channels in the coronary circulation, it acquires preference in the treatment of diabetes for elderly patients.¹⁵ Amitriptyline is a tricyclic antidepressant that has been widely used both in patients with 2 associated comorbidities or one of them alone. It has adverse effects such as sedation, dry mouth, urinary retention, blurred vision, high eye pressure, constipation, tachycardia, hypertension, changes in the electrocardiogram, heart failure, impaired memory and delirium, precipitation of hypomanic or manic episodes in bipolar depression; gastrointestinal disorders such as nausea, vomiting, abdominal pain, diarrhea; psychic effects such as agitation, anxiety, insomnia, nervousness, sleep disturbances, fatigue; and neurological effects such as tremors and extrapyramidal effects.¹⁶

Hypothyroidism is a common condition in individuals over 60 years of age, with a prevalence of 14 to 20% in this population.¹⁷ For its treatment, the medication of choice is levothyroxine, which was highly relevant among the participants in this research. Aging combined with poly-

medication potentiates the occurrence of drug interactions, and the DIs that interfere with the absorption of L-T4 do not reach patients clearly and precisely,

who are rarely oriented at the time of diagnosis or even when dispensing the medication and end up not showing improvement in the pathological condition.¹⁸ Omeprazole appears as a direct consequence of polypharmacy, and may be related to the inclusion of this drug in the patient's treatment, in order to relieve gastric symptoms associated with the excessive use of medications, reinforcing the hypothesis that from the use of several medications together, an iatrogenic cascade is obtained.¹⁶

CONCLUSION

From this research, it was possible to observe that the vast majority of the elderly are in polypharmacy, due to non-communicable chronic diseases. Also, very useful for health, very useful for the use of medicines, it turns out to be a practice, or more medicines, for it may bring benefits to health, it ought to be injurious to health, it ought to be injurious to health, it ought to be as injurious to health, as it ought to be injurious to health. What are the main recipes within

Table 2 - List of medications most used by the elderly evaluated

Hydrochlorothiazide	87 (0,51)
Losartan	98 (0,58)
AAS	
Enalapril	28 (0,17)
Simvastatin	67 (0,39)
Metformin	58 (0,34)
Fluoxetine	36 (0,21)
Gliclazide	24 (0,14)
Omeprazole	39 (0,23)
Levothyroxine	35 (0,20)
Amlodipine	36 (0,21)
Atenolol	27 (0,16)
TOTAL	170 (0,00)

Source: Researcher data, 2021.

the context, combination and in addition, iatro was evident when discussing the conformal effects of each genetics. In this way, a possible treatment can be considered that there is a need to cautiously propose to the patient, whenever opting for non-pharmacological measures proposed to avoid as pathologies of the therapy.

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