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## RESEARCH ARTICLE

### MEDICINESE INTERACTION IN ELDERLY USES OF POLIFARMACY REGISTERED IN A HEALTH UNIT OF THE POTION FAMILY

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#### ABSTRACT

The elderly presents a more susceptible profile to the multiplicity of chronic diseases, besides the deterioration of their hepatic and renal functions, compromising the metabolism and the excretion of the medicines. However, this article aims to identify the drug interactions in elderly people using polypharmacy registered in a health unit. The methodology used in this work aims to describe how the study was conducted, as well as the means used to collect the data. This study is an applied research. "An applied research indicates research of practical interest, where its results are solved". Once the search for ideas and/or thoughts is perfected, this research is exploratory. The questionnaires were preceded by the informed consent form, and applied by the researchers, in a formal and direct way to the users of the health service. Among the 241 patients analyzed, only 160 answered about the drug therapy administered, the remaining 81 patients did not report when approached. The 160 prescriptions showed a total of 357 potency drug interactions, with an average of 2.23 interactions per patient. Another study performed in intensive care unit patients reported a mean of 2.3 interactions per patient, corroborating with the results found, since drug interaction is one of the main variables that affect the therapeutic result and the higher the number of medications administered, consequently the greater the possibility of its occurrence. However, the pharmacist plays a fundamental role in pharmacotherapy, accompanying patients with polytherapy, analyzing each case in order to identify possible health risks by undue administrations and associations of medications, and thus intervene in pharmacotherapy when necessary.

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#### INTRODUCTION

Brazil is the sixth largest population of older people in the world, since in the last years data showed the presence of 16 million elderly people and by 2025 this data will be doubled to around 32 million (Ramos, LR et al.2016). Demographic aging, coupled with the epidemiological transition, characterized by a progressive increase in life expectancy, leads to an increase in chronic non-communicable diseases, resulting in the main causes of morbidity and mortality in the country (Silveira et al., 2014). The elderly presents a more susceptible profile to the multiplicity of chronic diseases, besides the deterioration of their hepatic and renal functions, compromising the metabolism and the excretion of the medicines (Veras 2012). Since, due to the aging process that occurs in a progressive and dynamic way, morphological,

functional and biochemical changes occur, impairing the functional capacity and leading to the individual becoming more vulnerable to health problems (Tavares et al., 2012). While different symptoms and diseases begin to emerge and weaken the elderly age group, the need for health resources increases, the use of medications. Since more than 70% of the elderly present at least some chronic disease, needing treatment of medication of continuous use and thus favoring the act of polypharmacy, being this one of the predominant factors for problems arising from pharmacological treatment (Silva and Macedo, 2013). Polypharmacy is an important factor when it comes to problems in the care of the elderly, since it is characterized by the use of 5 medications or more, being a growing problem in the health area and should always be studied and avoided when possible (Alessandra, LGLG et al., 2010) (Edelma et al., 2013).

Although polypharmacy is often necessary, undue use of this type of pharmacological treatment can lead to serious problems such as drug interaction resulting in negative clinical outcomes for the individual's health (Varallo *et al.*, 2013). Drug interaction is characterized by administering two or more drugs so that the safety or efficacy of one drug is significantly altered by the action of the other administered previously or in concomitance with the former (Cedraz and Junior, 2014). Different risk factors can lead to problems resulting from drug associations, such as medical prescription, where the increased risk of drug interaction is proportional to the amount of medication prescribed, as well as the patient's condition, such as age, sex and health deterioration. that the prescription becomes even more complex (LealDFL *et al.*, 2014). Potential drug associations, ie, which may result in adverse reactions and health hazards, represent a determinant indicator of quality of prescription. This indicator is evaluated by the amount of medication contained in the prescription (LEAL DFL *et al.*, 2014). Due to the increasing potential for the occurrence of drug interactions in the elderly due to the greater number of pathologies and, consequently, the use of a greater quantity of drugs, we see the importance of the evaluation of pharmacotherapy, which should be used as a quality assessment instrument addition, the focus of attention on the elderly is to improve the quality of life of the elderly (Ribas and Oliveira, 2014). In Elderly patients from the age of 60 years were analyzed, being this the initial age for the elderly age group (BUENO *et al.*, 2009). This age group was chosen for the analysis, since the elderly are possibly the most medicated age group in society because of the aging factor and what it can cause (Carvalho *et al.*, 2011). However, this article aims to identify the drug interactions in elderly people using polypharmacy registered in a health unit of the Poções Municipality - BA.

## METHODOLOGY

**Type of study:** According to Bogdan and Biklen (1982), "research is a formal procedure, which has as its method, reflective thinking that will constitute the way to discover, and know the reality of form seeking answers to the questions proposed, using scientific methods." The methodology used in this work aims to describe how the study was conducted, as well as the means used to collect the data. This study is an applied research. "An applied research indicates research of practical interest, where its results are solved" (BOGDAN and BIKLEN, 1982, p.19). Once the search for ideas and / or thoughts is perfected, this research is exploratory, according to Gil (2007). "(...) exploratory study has as main objective the improvement of ideas or the discovery of intuitions (...)" (p.41), and descriptive. "(...) descriptive research has as main objective to identify the characteristics of a certain population or phenomenon or, therefore, the establishment of relations between variables (...)" (p.42). This study is framed within a field research structure, "(...) that is used in order to obtain information and / or knowledge about a problem, for which a response can be identified (...)" (Bogdan And Biklen, 1982, p.19). The research is inserted in the methodological frameworks of a quantitative nature, that is, the population will be chosen in the form of sampling, being applied to the elderly users, who use polypharmacy, who are accompanied by the family health service.

**Field of data collection:** As a field of study of this scientific research was used the Health Unit Leandro Silva de Souza located in the city of Potions - BA, in the neighborhoods Indaiá

and Tiradentes. Its area covers 1325 families and consists of 3,989 people. The team consists of 14 professionals: 01 doctor, 01 nurse, 02 nursing technicians, 01 odontologist, 01 oral health assistant, 01 general services assistant and 07 health agents. The team has the support of the Family Assistance Center (NASF) composed of multi professionals. This unit was chosen because the researcher is residing in the area of coverage of the same, the other health units were not chosen because it is not located near my residence with this facilitating the application of the research.

**Subjects:** The subjects of this study were 241 patients from a total of 3,989 elderly users who use polypharmacy, who are followed up by a Family Health Unit in Bahia. The confidence interval presented was of 90% and error of 10%.

**Risks:** It can be generated during the filling of the questionnaire discomfort, embarrassment leading to the forging of information. It is intended to ease the discomfort by applying the questionnaire in a private room, to avoid any embarrassment the interviewee will be free to answer any question that may feel uncomfortable, the researcher will be careful to keep all information in a safe place to avoid possible leakage.

**Benefits:** This research aims to demonstrate the possibility of drug interactions in the administration of polypharmacy and thus contribute to evaluation of drug interaction in the community, raising possible warning signs regarding the incorrect use of medications. Their collaboration will be done anonymously, through the completion of the questionnaire and that the research objectives are strictly academic.

**Procedures for data:** Collection A questionnaire was used as a data collection tool, which in Bogdan and Biklen's (1982, p.26) conception. "Is an instrument of data collection, consisting of an ordered series of questionnaires, which must be answered in writing and without the presence of the researcher." The questionnaires were preceded by the informed consent form, and applied by the researchers, in a formal and direct way to the users of the health service. For the collection of data was made available by the team of the health unit from 08:00 to 11:00 in the morning during the period of 20 days. As the elders came to the unit, they were approached and questioned about the possibility of responding to the questionnaire of their own free will. After the consent, the researcher asked the questions and recorded the responses of the users, totaling at the end of the survey 241 questionnaires answered. With all data obtained, drug interactions were evaluated through the use of a free access bibliographic source on the Internet, Drug Interaction Checker, which uses information from the Drug Reference® and is available from Medscape® and classified as severe, moderate, or minimal, Medscape® was used because it is often used by healthcare professionals to evaluate drug interactions.

**Ethical issues:** This study was based on Resolution no. 196/96 of the National Health Council - CNS, which provide for research on human beings, and guarantees to them the respect, secrecy and anonymity of information. Thus, the initial approach consisted of the identification of the researcher with the presentation of the informed consent, confirming their participation in the sampling for the development of the research.

## RESULTS AND DISCUSSION

The questionnaires completed by 241 elderly people in polypharmacy registered in a family health unit were analyzed. Among the 241 patients analyzed, only 160 answered about the drug therapy administered, the remaining 81 patients did not report when approached. The 160 prescriptions showed a total of 357 potency drug interactions, with an average of 2.23 interactions per patient. Another study performed in intensive care unit patients reported a mean of 2.3 interactions per patient, corroborating with the results found, since drug interaction is one of the main variables that affect the therapeutic result and the higher the number of medications administered, consequently the greater the possibility of its occurrence (VIEIRA, LB *et al.*, 2012). The analyzes showed a great difference in gender percentage, verifying that 153 (63.5%) of the interviewees were female and 88 (36.5%) were male. Studies indicate that drug interactions occur more frequently in the elderly female and are even more aggravated in women with chronic diseases (Gotardelo, DR *et al.*, 2014). This result reinforces the occurrence of feminization of old age, due to the longer life expectancy of Brazilian women, and this fact is also observed in other studies (Fochat, RC *et al.*, 2012). The data show that the majority of the elderly administer 2 or more associated medications, such fact occurs in the attempt to stabilize or cure different diseases and health problems, as demonstrated by a study carried out in Brazil (Ventet *al.*, 2016). However, while the administration of different drugs in association is aimed at improving the individual, it may also increase the risk of adverse drug reactions due to drug interaction, ranging from medication errors and reduction of adherence to pharmacotherapy, even cumulative toxicity and in more severe cases, morbidity and mortality (Secoli, SR 2010).

Another study has also resulted in the great risk of MI in elderly patients who had associations of 2 or more drugs, but the risk becomes even more eminent in the administration of polypharmacy resulting in adverse reactions or other complications in treatment (Fochat, RC *et al.*, 2012). The aged between 70 and 75 years was most likely the occurrence of drug interactions (32,21%). A study of elderly people with polypharmacy in a public hospital has shown that there is a greater occurrence of drug interaction among older people, due to the trend towards polypharmacy (Cuentro, VS *et al.*, 2016). Based on the data obtained in table 3, he realizes that since the beginning of the third age, the elderly already presents a pharmacological therapy with several associations, and this most of the time is maintained continuously over the years. this is due once again to the aging process that brings along with age, chronic diseases and other problems that almost always remain throughout the elderly (Tavares, KO *et al.*, 2012). The combination of several drugs ends up not guaranteeing full benefit to the patient, since together with the advantages of the therapeutic probability, the risk of undesirable effects resulting from the drug interaction is shown (Blanski, CR K, Lenardt, MH 2005). Regarding the administration of non-prescription medicines, 196 (81.33%) reported that they do or have already used medications without and 45 (18.67) were not. It is noted that most users have already made use of medications on their own. In another study carried out in the elderly of a Family Health Program in São Luís, MA, also reported the same results and the main reasons cited were lack of time to seek health professionals and services and by indication of a known one (Monteiro, SCM *et al.*, 2014).

**Table 1 - Percentage of drug interactions found per patient.**

Variables	N	Prescriptions analyzed	IM N	Mean IM per patient
Elderly using polypharmacy	241	160	357	2.33

IM: Drug Interaction

**Table 2. Descriptive analysis of the population studied for the evaluation of drug interactions.**

Variables	N	%	Variables	N	%
Sex			Qty. of drugs		
Male	88	36.5%	1 Medication	36	15.0%
Female	153	63.5%	2 Medications	71	29.5%
Age			3 Medications	61	25.3%
60 - 65	71	29.5%	4 Medications	17	7.0 %
65 - 70	31	12.86%	5 drugs	10	4.2%
70 - 75	82	34.0%	6 medicines	2	0.83%
75 - 80	55	22.8%	7 or more drugs	2	0.83%
Above 80 years	2	0,82%	They did not report	42	17,4%

**Table 3. Demonstrates the relationship between the percentage of drug interaction by age of the patients**

Variables	N	%	IM	N	%
Age					
60 - 65	42	26.25%	112	31.37%	
65 - 70	16	10.0%	29	8.12%	
70-75	57	35.63%	115	32.21%	
75-80	44	27.5%	96	26.89%	
80 years	1	0.62%	5:	1.41%	

IM drug interaction

**Table 4. Analysis of the administration or non-prescription of non-prescription medicines**

Variables	N	%
Already administered medication without a prescription		
Yes	196	81.33%
No	45	18.67%

**Table 5. Classification of the most frequent potential drug interactions according to the Medscape® database**

Medication 1	Medication 2	Medscape	N	(%)
AAS	Losartan	Moderate	86	31.62%
Hydrochlorothiazide	Losartan	Moderate	62	22.80%
Metformin	Hydrochlorothiazide	Minor	26	9.56%
AAS	Hydrochlorothiazide	Moderate	25	9.19%
Losartan	Atenolol	Moderate	17	6.25%
Captopril	AAS	Severe	15	5.51%
AAS	Losartan	Moderate	10	3.68%
Spirolactone	Digoxin	Moderate	9	3.31%
Simvastatin	Amlodipine	Severe	8	2.94%
Propranolol	AAS	Moderate	8	2.94%
Losartan	Enalapril	Severe	3	1.10 %
Omeprazole	Digoxin	Severe	3	1.10%

**Table 6. Analysis regarding the knowledge and information of patients regarding drug interactions**

Variables	N	%
Have you ever heard of IM		
Yes		
No	12	4.98%
No answered	222	92.12%
Have you received IM guidance	7	2.90%
Yes		
No	9	3.73%
No answer	228	94.61%
	4	1.66 %

IM: drug interaction

Among the results found in table 3, some drugs are repeated in different associations, due to the chronic diseases that are common in the elderly age group, such as hypertension and

diabetes (Carvalho *et al.*, 2011). Regarding drug interactions, potencies classified as serious, the association between captopril classified as ACEI and AAS that is part of the IANE, the interaction between these drugs may be potentially dangerous, since the vasodilator effect of ACE inhibitors may be attenuated by the inhibition of prostaglandin synthesis due to the action of ASA, restricting adequate BP control in hypertensive patients. This interaction was also reported in the study by Gennaro *et al.* (2004). Concomitant use of amlodipine with simvastatin is also classified as a serious association, since amlodipine is a calcium channel blocker antihypertensive and may cause increased risk of adverse effects of simvastatin due to increased serum statin levels by (d)inhibition of the metabolism of simvastatin by amlodipine through intestinal and hepatic CYP450 3A4, this association could also be seen in the study carried out with elderly people in the municipality of Timóteo, MG (Gotardelo *et al.*, 2014).

Simvastatin alone increases the risk of myopathy induced by statins when given at 80mg and when associated with amlodipine, further increase the risk of skeletal muscle toxicity (Santos, RP 2012). Losartan, together with enalapril, is considered to be an association with serious drug interactions, since the concomitant use of these two drugs may lead to a decrease in blood pressure. This association was found in a study in medical prescriptions in the city of Mogi Iguçu (Pereira, K. S, Silva, LO 2016). There was also drug interaction with the combination of omeprazole and digoxin, another similar study showed correlative results (Tavares, MS *et al.*, 2012). Omeprazole interferes in the pharmacokinetic steps of many drugs, leading to the inhibition or induction of cytochrome P450 and inhibition of oral absorption due to gastric suppression (Ribeiro *et al.*, 2017). The association of omeprazole with digoxin is considered to be severe, since omeprazole causes an inhibition of gastric acid secretion, causing an increase in the bioavailability of digoxin, leading to the individual's toxicity (FARIA, LMP; Cassiani, SHB 2011). Regarding the classification of the severity of potential drug interactions, the source of the information consulted was Medscape®, which presents the data that is always updated and referenced. This is a safe source of data, being mentioned as a reference in publications of services and national centers of information related to medicines (Catisti and Cruciol-Souza, 2009).

Where the 241-elderly examined 222 (92.12%) have never heard of drug interactions, 12 (4.98%) have heard and 7 (2.90%) did not answer. When asked if they had already received any guidance on the subject, 228 (94.61%) answered that no, 9 (3.73%) said yes and 4 (1.66%) did not respond. This lack of guidance may be due to various causes such as the short-term medical consultation and the time of dispensation, the lack of on-site pharmaceutical practices, including the absence of the pharmacist, lack of training of the individuals who dispense drugs and often to the absence of any instructions and clarification to the patients, implying a low level of understanding and knowledge of them, as indicated by another study about pharmaceutical assistance in a family health program (Alencar and Nascimento, 2011). Pharmaceutical care (PA) encompasses all individual or collective health care, whose medication being an essential treatment, must be guaranteed full access as well as rational use (Vieira, 2010). AF can be applied as a means of educational activities, conditioning patients to a better understanding of their illness or injury, and the importance of

correctly following the plan of care, correct administration of medications, which can lead to incorrect use of these. Together, all these activities besides educating and assisting the patients, also gives support mainly the elderly ones that present a greater difficulty of understanding and therapeutic adherence (Soler *et al.*, 2010). In order to reduce the occurrence of adverse drug events and failures in pharmacological therapy, the search for programs and initiatives that promote the prevention of harm and the improvement of the quality of services offered to patients, such as the analysis of prescriptions before of the dispensation, the elaboration and protocolation of a database of medicines in both the public and private sectors can also be carried out (Mazzola *et al.*, 2011). The presence of health professionals, especially the pharmacist, who is directly involved with medicines, is essential and emergency in the health services, especially at the time of dispensing pharmacological therapy, aiming at the best possible clarification of administration for patients, mainly the elderly age group that present a greater difficulty of understanding and adherence to pharmacotherapy (Moreno *et al.*, 2007).

**Final considerations:** Based on the results obtained in the study, there is a need for a better understanding of the MI of each drug by those who prescribe the measurement, and the control of the pharmacist at the time of dispensing to analyze the possible MI, avoiding potential adverse events. It also becomes necessary, the information to the patient regarding the pharmacotherapy administered. During the study there were limitations on the prescription of some patients because they were able to inform which medicines were administered, making clear the failure at the time of dispensing the drug about the information that must be passed and explained clearly to the patient. Note the lack of information about the correct form of administration and the risks that the incorrect use of drugs can cause to its users directly implying the patient's health in a negative way. However, the pharmacist plays a fundamental role in pharmacotherapy, accompanying patients with polytherapy, analyzing each case in order to identify possible health risks by undue administrations and associations of medications, and thus intervene in pharmacotherapy when necessary. In addition to providing information about drug therapy clearly to patients avoiding possible errors at the time of administration. Medscape®, which was the database used, was relatively effective during MI analyzes, but this fact does not dispense with the search for other sources of information with reliable references about the main MIs. The pharmacist should always be looking for new information since the pharmaceutical industry is always updating itself.

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