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Depression and Cognitive Decline: Factors Related to Demographics and Psycho Pharmacotherapy on Elderly in Nursing Homes

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Abstract

Objectives: To identify the prevalence of neuropsychiatric disorders, especially DP and CD, on a sample of nursing home residents, relating this prevalence with some aspects of the demographics and psycho pharmacotherapy.

Methods: 48 elders from two different nursing homes were selected. The collection of demographic and pharmacological data was made utilizing medical records. The medication was classified according to the Anatomical Therapeutic Chemical Code (ATC) criteria. The Geriatric Depression Scale (GDS 30) and the Mini Mental State Examination (MMSE) tests were utilized to determine the prevalence of DP and CD.

Results: It was observed in the sample a high incidence of DP and CD among the researched elders. More schooling individuals tend to present less CD. Individuals with less CD indicatives present less symptomatology for DP. Of all the researched elders, 54,2% are submitted to psycho pharmacotherapy. Of all the consumed medicine, 16,5% belonged to the class of neuropsychiatric medicine. The medicated elders present, in average, a larger symptomatology for DP (12 points/average/GDS) than the non-medicated elders (9,9 points/average/GDS). The inverse occurs in relation to the CD indicatives. The use of psychotropics, especially in association, can have negative effects related to depression and cognition.

Discussion: The pharmacotherapy, characterized for the polymedication and chronicity, especially of neuropsychiatric medicines, deserves special attention among elders, because the data suggest a significant relation between the utilization of medicines, singly or in association, and the increase of CD and DP. In addition, the data suggest that DP is a risk factor for CD and DM.

Keywords: Cognitive decline; Depression; Elderly; Nursing home; Psycho pharmacotherapy

Introduction

The aging of the population is a global phenomenon and has worried professionals of several knowledge areas and public managers. In the developed countries, the growth of the elderly population has been studied for several years. In the emergent and/or development countries, just recently this theme has aroused a larger interest. In Brazil, the elders represented just 3,2% of the general population in the 1900 and this number increased to 4,7% in 1960, may reach 13,8% in the year of 2025. Today, we have approximately 11 million people over the age of 60 and projections indicate that we will be the 6th country in the world in number of elders in the year of 2020, with approximately 32 million [1]. According to projections of the Brazilian Institute of Geography and Statistics (IBGE), the life expectancy of the Brazilian population for the years 2013 and 2014 was respectively 74,8 and 75,1 years. However, Brazil will continue to grow in terms of average life expectancy of the population, being able to reach in 2020 a life expectancy of 76,7 years and, in 2060, 81,2 years [1].

Has called attention the increasing incidence of neuropsychiatric disorders in the elderly population, including the cognitive decline (CD), dementia (DM) and depression (DP) as the most common pathologies [2]. Changes experienced by the old age, such as the lost of a spouse, the decline of physical and cognitive capacity and the admission to nursing homes can be the breaking point for the emergence of neuropsychiatric disorders [3].

In Brazil, the incidence of DM on elders resident on the community reaches the rate of 13,8 per 1000 habitants/year, and for Alzheimer Disease (AD) the rate is 7,79. DP has prevalence rates between 5% and 35%, ranging according to severity level. The prevalence of DP in the population over 65 years of age in Brazil reaches up to 14,3% [4,5]. At average, the prevalence of geriatric DP on elderly in nursing homes is 60% and on elders that live in the community is 10% [6], which according to Lebowitz and collaborators generates great impact on the health services [7]. It is noteworthy that the majority of the cases manifest more somatic and cognitive symptoms than mood alterations [8-10], and there are indicatives that DP is an important risk factor for CD and DM [11-13].

DSM-IVTR (Diagnostic and Statistical Manual of Mental Disorders) defines DM as a syndrome characterized by the memory decline associated to the impairment of at least one other cognitive function (language, gnosias, praxis or executive functions) with enough intensity to interfere on the social or professional performance of the individual [14].

In turn, CD can be a consequence to a mood disorder, use of certain medicines, traumas, etc, and/or be a result of physiological processes related to normal aging or even from a stage of transition to DM. CD, which can vary from light to severe, is considered a heterogeneous entity in its characteristics and clinical trajectory. Therefore, individuals with light CD may evolve to DM or remain stable. Studies show that elders with CD (particularly those with episodic memory deficit) present a larger risk of developing AD. However, on elderly populations it is more common the development of a light CD [15]. It is important to point out that researches indicate the schooling as a protection factor to CD and DM [16,17]. The growing condition of neuropsychiatric disorders among the elderly, along with the occurrence of other chronic diseases, has been responsible for increasing the use of medicines in this age group, which represents 50% of the medicine consumers [18,19] and the population with a higher index of polymedication [20]. The majority of the elders utilize in a continuous manner at least one medicine, and that the average of the medicine utilized by these individuals is between two and five medicines [21,22]. The literature has pointed out that the higher the quantity of medicine consumed, the higher is the risk of problems related to medicine (PRMs) emerge [23]. In this sense, the low number of medicine used, the absence of medicine contraindicated to the age group and the absence of associations that may provoke potentially dangerous medicine interactions are indicatives of an adequate pharmacotherapy for the elders [24-26].

Furthermore, the neuropsychiatric status of the elderly, along with other factors such as social exclusion, prevalence of chronic diseases, absence of familiar environment/structure to supplement the elders' necessities [27], has been considered as a determinant of Elders' admission in Elders Long Permanence Institutions (ELPIs), also known in Brazil as "nursing homes". With the process of admission in nursing homes, elders start to live in a poor environment in terms of physical, cognitive and social stimulation and start to fit themselves in a category of people deprived of projects, family and friends interactions, estranged from their own household, out of the context in which their life's history was built [28]. This way, the context that evolves the admission in nursing homes process sensitively collaborates for the installation or aggravation of neuropsychiatric disorders on elderly. Thus, the aim of the present study was to identify the prevalence of neuropsychiatric disorders, especially DP and CD, on a sample of nursing home residents, relating this prevalence with some aspects of the demographics and psycho pharmacotherapy.

Methods

The research was performed in two nursing homes located in the city of Marilia-São Paulo, Brazil. The elders were selected after the initial interview, according to the eligibility criteria established, which considered only the elders that presented hearing, linguistic and cognitive capacities sufficient to comprehend and answer the questions and tests fixed for the research. For this study, a sample of 48 elders was selected. Demographic and general health data were collected from the medical records of the selected elders. For the gathering of data related to the incidence of DP, the Geriatric Depression Scale (GDS-30) was applied [29] and, for the incidence of CD, the Mini Mental (MMSE) [30] was applied. For the GDS-30, the following cut-off points were considered: 0-10 points (normal) and 11 or more (probable DP). From this cut-off point, the following classification was defined, as indicated in other studies: without DP (up to 10 points); light DP (11 to 20 points); moderate to severe DP

(21 to 30 points). It is important to point out that, for the diagnosis of DP, considering the criteria of CID-10, the 10 cut-off point presents sensibility of 100% and specificity of 88% [31]. For the Mini Mental State Examination (MMSE) the following cut-off points were adopted: among the elderly with some schooling it was utilized the cut-off of 24 (0-24=cognitive decline indicative; 25 or more=normal) and for the elderly with no schooling, the cut-off point of 19 (0-19=cognitive decline indicative; 20 or more=normal) [32,33].

The gathering of the psycho pharmacotherapy administrated to the elders was performed in the nursing home's infirmaries. The classification of the neuropsychiatric medicine administrated was defined from the classification criteria of the Anatomical Therapeutic Chemical Code (ATC) [34]. The four levels defined on ATC were taken under consideration: anatomical groups (1st level); main therapeutic groups (2nd level); therapeutic-pharmacological subgroup (3rd level) and therapeutic/pharmacological/chemical subgroup (4th level). The data were tabulated and descriptively analyzed. For the statistical analysis was used the SPSS software for Windows, version 20.0. Differences among the groups were analyzed with the Student t test; to verify the association between gender, schooling, DP and CD indicatives the Pearson x^2 test was utilized and, due to a theoretical restriction, the Fisher Exact Text (FET). It was adopted a 5% probability level for the rejection of the nullity hypothesis on all the tests.

This study was in conformity with the ethical principles indicated in the 196/96 resolution of the National Health Consul – Brazil's Ministry of Health. The execution of the research was approved by the Research's Ethical Committee of the Faculdade de Filosofia e Ciências-FFC of the Universidade Estadual Paulista – UNESP, Marília, São Paulo, Brazil (n. 1198/2010).

Results

Subjects

Among the 48 elders of this study, the most part of them were between 77-82 years old (Table 1). The general average, in terms of age, was 74,5 years old [dp=8,5]. Related to gender, 24 [50%] were male and 24 [50%] were female, and the average age was 74,4 years old to female and 74,5 to male. Considering the schooling, the most part of elders is literate, and among the male elders the literate rate is bigger than female (Table 2).

Age	%	n
59-64	16,7	8
65-70	16,7	8
71-76	25	12
77-82	29,2	14
83-89	12,5	6
Total	100	48

Table 1: Distribution of 48 elders admitted in nursing homes according to age in the city of Marília, São Paulo, Brazil, in the year of 2013.

Neuropsychiatric Disorders

In relation to the prevalence of DP, 24 [50%] presented light DP. The others 24 [50%] did not present any level of DP. There is a greater prevalence of DP among the male elders. However, no difference was observed between the genders in the average score obtained on GDS (p>0,05; Table 3). Related to the age, data indicate a larger prevalence of DP on elders over 70 years old, revealing a positive regular correlation between age and DP (rPearson=0,557; p=0,005) for this sample (Table 4).

Gender	Literate		Non-literate	
	%	n	%	n
Male	33,3	16	16,7	8
Female	25	12	25	12
Total	58,3	28	41,7	20

Table 2: Distribution of 48 elders admitted in nursing homes according to schooling in the city of Marília, São Paulo, Brazil, in the year of 2013.

Gender	With DP		GDS
	%	n	
Male	58,3	14	10,1 [dp = 5,3]
Female	41,7	10	10,3 [dp = 6,9]
Total	100	24	

Table 3: Distribution of 24 elders admitted in nursing homes with DP indicative according to gender in the city of Marília, São Paulo, Brazil, in the year of 2013.

Age	With DP	
	%	n
59-64	12,5	3
65-70	0	0
71-76	50	12
77-82	37,5	9
Total	100	24
F.E.T.: p=0,005		

Table 4: Distribution of 24 elders admitted in nursing homes with DP indicative according to age in the city of Marília, São Paulo, Brazil, in the year of 2013.

It was identified on the analyzed sample that 26 (54,2%) subjects presented CD. Of this total, 16 [61,6%] were female and 10 [38,4%] were male. It was not identified a relation between gender and CD (p=0,565) or schooling and CD (p=0,527). However, the absolute numbers indicate a higher prevalence of elders with CD indicative among the non-literate in comparison to the literate (Table 5). In addition, considering the age, it was identified that, of the elders who presented CD indicative, 50% of them was between 71 and 89 years old. The results pointed, on this sample, to a negative correlation, although non-significant, between CD and age.

Schooling	With CD		Without CD	
	%	n	%	n
Literate	38,5	10	45,5	10
Non-literate	61,5	16	54,5	12
Total	100	26	100	22
F.E.T: p= 0,527				

Table 5: Distribution of 48 elders admitted in nursing homes with or without CD indicative according to schooling in the city of Marília, São Paulo, Brazil, in the year of 2013.

Among the 48 studied elders, 16 [33,3%], in which 10 [20,8%] were female and 6 [12,5%] were male, presented at the same time DP and CD [(+)DP(+)CD]. From the results relative to the presence of DP and/or CD, the elderly were classified into four groups (Table 6). The result of the X2 Test for the proportions of individuals in the groups was non-significant (pMonte Carlo=0,053), indicating that these proportions, related to the presence of DP and/or CD, were similar on the sample. The results of this study point also to the occurrence of a regular negative correlation between the results of GDS and MMSE (r=-0,406; p=0,049), which indicates that the GDS scores decrease when there is an increase on MMSE scores.

(+) DP (+) CD		(-) DP (+) CD		(+) DP (-) CD		(-) DP (-) CD	
%	n	%	n	%	n	%	n
33,3	16	21,0	10	4,2	2	41,6	20

Table 6: Incidence of DP and/or CD on 48 elders admitted in nursing homes in the city of Marília, São Paulo, Brazil, in the year of 2013. Teste: $\chi^2 = 7,667$; gl=3; pMonte Carlo=0,053

Psychopharmacotherapy

In relation to the pharmacotherapy of elders, 6 [12,5%] do not consume any type of medicine. Due to the incidence of chronic diseases, 42 elders [87,5%] consume, without considering the defined daily dosages (DDD), 364 medicines of continuous use per day, which can be translated into an general average of 8,6 medicine/elder/day to the group of medicated elders, with an average of 8,4 medicine/day to male and 9,7 medicine/day to female.

Considering the Anatomical Therapeutic Chemical Code (ATC) criteria, of all the medicine consumed, 62 [17,0%] belonged to the anatomical group of nervous system (N), distributed according to the subgroups presented in Table 7. It was observed that female elders are more medicated than male, consuming an average of 1,8 neuropsychiatric medicine/day against 1 neuropsychiatric medicine/day to male. It was also possible to observe that there is a higher consumption of anxiolytic, especially among the female elders (Table 7).

Main Therapeutic Group	Therapeutic-Pharmacological Subgroup	Therapeutic/pharmacological/ chemical Subgroup	%	Medicine/day		Elders users	
				Male	Female	%	n
Psycholeptics (N05)	Anxiolytic (N05B)	Benzodiazepines (N05BA)	4,4	0,3	0,6	36,4	16
	Antipsychotics (N05A)		2,2	0,2	0,2	18,2	8
Psychoanaleptics (N06)	Antidepressant (N06A)	Tricyclic (N06AA)	2,2	-	0,4	18,2	8
		Selective serotonin reuptake inhibitors (SSRI) (N06AB)	3,8	0,4	0,3	14	
		Atypical Antidepressant (N06AX)	1,1	-	1	2	
Antiparkinson (N04)	Dopaminergic Agents (N04B)		1,1	-	0,2	9,1	4
Others (N07)	Nootropic (N07X)		2,2	0,1	0,3	18,1	8

Table 7: Classification of medicines related to anatomical group of nervous system (N) according to the ATC criteria and their consumption by 42 elders admitted in nursing homes in the city of Marilia, São Paulo, Brazil, in the year of 2013.

The most part of the elders is submitted to psychopharmacotherapy (Table 8). Data indicate that, in general, the elders who were medicated with neuropsychiatric medicine present smaller DP and CD isolated incidence. However, there is an inverse effect about (+) DP (+) CD incidence; the elders who were medicated with neuropsychiatric medicine present higher (+) DP (+) CD incidence (Table 8).

Comparing the data of the two groups (medicated with neuropsychiatric medicine and non-medicated) with the results of the tests (GDS and MMSE), it was found that the medicated elders present, in average, a larger symptomatology for DP than the non-medicated ones. The inverse occurs in relation to CD indicatives, once elders medicated with neuropsychiatric medicine obtained smaller CD indicatives compared with non-medicated subjects (Table 8).

Utilization of neuropsychiatric medicine	%	n	(+) DP (-) CD		(-) DP (+) CD		(+) DP(+) CD		Average GDS	Average MMSE
			%	n	%	n	%	n		
Non-medicated	45,8	19	12,5	6	16,7	8	16,7	8	9,9	19,9
Male	25	10	8,3	4	8,3	4	8,3	4	11	21,3
Female	20,8	9	4,1	2	8,3	4	8,3	4	8,8	18,6
Medicated	54,2	23	4,1	2	4,1	2	33,3	16	12	21,7
Male	25	11	4,1	2	-	-	12,5	6	9,5	23,1
Female	29,2	12	-	-	4,1	2	20,8	10	14	20,6

Table 8: DP and/or CD incidence on users and non-users of neuropsychiatric medicine on a sample of 42 elders admitted in nursing homes in the city of Marilia, São Paulo, Brazil, in the year of 2013.

The elders medicated only with psycholeptics (anxiolytic [ANX]; antipsychotics [ANP]) and psychoanaleptics (antidepressant [ADP]), isolated or in association, were distributed as presented in Table 9. Isolated incidence of DP occurred only on the elders who consumed ADP+ANX, while isolated CD occurred on the elders medicated with ADP and ADP+ANP. (+) DP (+) CD occurred on the elders medicated with ADP or ANX and on the elders medicated with ADP +ANX and ADP+ANX+ANP (Table 9).

The average results of GDS and MMSE suggests that the indicatives of DP and CD among the elderly medicated with ADP and ANP are

low. Nevertheless, the indicators of DP and CD among elders medicated with ANX and all the associations between psycholeptics and psychoanaleptics medicines are high (Table 6).

Regarding the distribution by gender, it is important to observe that among the elderly that use only ADPs, the male present a smaller DP and CD indicative if compared to female. In relation to the DP indicatives among the female and male elders to whom ANX are administrated, there were no differences, and both genders obtained a high DP indicative. However, in relation to CD, the male who consume only ANX presented a worst performance on MMSE than female. Among the male elders to whom is administrated ADP+ANX association, it was observed a higher DP and CD indicatives than in female. The use of ADP+ANP and ADP+ANX+ANP was only observed among the female elders, who presented DP and CD indicatives. In addition, the use of ANP was only observed among the male elders that presented strong DP indicative (Table 9).

Class/Association	%	n	(+) DP (-) CD		(-) DP (+) CD		(+) DP (+) CD		Average GDS	Average MMSE
			%	n	%	n	%	n		
ADP	32	8	-	-	8	2	8	2	6,7	26,2
Male	16	4	-	-	-	-	-	-	4	28,5
Female	16	4	-	-	8	2	8	2	9,5	24
ANX	16	4	-	-	-	-	16	4	18	22,5
Male	8	2	-	-	-	-	8	2	18	21
Female	8	2	-	-	-	-	8	2	18	24
ANP	8	2	-	-	-	-	-	-	2	25
Male	8	2	-	-	-	-	-	-	3	25
Female	-	-	-	-	-	-	-	-	-	-
ADP + ANX	32	8	8	2	-	-	16	4	12,5	20
Male	16	4	-	-	-	-	8	2	13	18
Female	16	4	8	2	-	-	8	2	11,5	22
ADP + ANP	8	2	-	-	8	2	-	-	11,5	18,5
Male	-	-	-	-	-	-	-	-	-	-
Female	8	2	-	-	8	2	-	-	11,5	18,5
ADP + ANX + ANP	8	2	-	-	-	-	8	2	19,5	14,5
Male	-	-	-	-	-	-	-	-	-	-
Female	8	2	-	-	-	-	8	2	19,5	14,5

Table 9: DP and/or CD incidence on users of psycholeptic and psychoanaleptic medicine and associations on a sample of 26 elders admitted in nursing homes in the city of Marília, São Paulo, Brazil, in the year of 2013.

Discussion

The aim of the present study was to identify the prevalence of neuropsychiatric disorders, especially DP and CD, on a sample of nursing home residents, relating this prevalence with some aspects of the demographics and psycho pharmacotherapy.

Regarding to social demographic data was observed that the age average of the researched elders was 74,5 years old, which is coherent to the data of IBGE which indicate that the populations' average life expectancy is 74,8 years old in 2013 and 75,1 in 2014 [1]. In schooling terms, it was verified that 41,7% of the researched elders are non-literate, surpassing the estimates achieved in 2003 by the Education Ministry, which defined that 30% of the elders in Brazil were non-literate [35].

In relation to the prevalence of neuropsychiatric disorders, DP and CD indicatives were verified by the application of the GDS and MMSE, respectively. In relation to the prevalence of DP, GDS pointed out that 50% of the researched elders presented a light DP indicative, which is in agreement with researches that indicate a high prevalence of DP on geriatric populations [4,5]. The prevalence rate of symptomatology for DP found on this sample are consistent with the findings of Reynolds and Kupfer which estimate that the prevalence of geriatric DP on elders admitted in nursing homes is 60%6. It was observed a higher DP prevalence on male subjects [58,3%]; however, it was not observed a significant difference between the average score obtained on male and female GDS, indicating that, in principle, the 'gender' variable would not be directly related to the DP prevalence on the elderly in nursing homes. The results of present study are in

agreement to other studies in which the 'gender' variable was not proven to be significant [36-38], although in some studies it was observed a higher prevalence of DP in female elders [39,40]. It was observed a higher DP prevalence among the elders belonging to the 71-76 [50%] and the 77-82 [37,5%] age groups. From the analysis of the results, the 'age' variable shown to be significant, with the results pointing out to a positive regular correlation between age and DP, which reinforces, although some studies show the opposite [37,38] the hypothesis that the increase of DP prevalence accompanies the age increase [36,39,41,42].

In relation to the prevalence of CD, the results of this study indicated that, from the application of MMSE, 54,2% of the elderly presented CD. Although the results indicate a higher CD prevalence among female elders [61,6%], it was not identified a relation between gender and CD (p=0,565) and schooling and CD, even though the absolute numbers have indicated a higher prevalence of elders with CD among the non-literate ones [61,5%]. It is important to consider that the female represented 60% of the non-literate elders.

The literature about the utilization of MMSE for the detection of CD have indicated the sensibility and trust of this instrument to detect DM on subjects with good schooling [43-45]. Furthermore, Srinivasan points out that the instrument presents little sensibility to detect light CD [46]. Other researches with larger samples indicated that male elders have a higher average score on MMES (25,28) than the female (24,51) [47,48]. Therefore, the results of this study show to be coherent with the limitations pointed out in relation to MMSE. Related to the age, although the results point out to a negative, but not significant, correlation (r=-0,228; p=0,284) between CD and age, it cannot be discarded, according to the appointments in the literature, the impact of age on the results obtained on MMSE is an important factor for CD prevalence [28,49].

It was not surprising the fact that 33,3% of the researched elders presented (+) DP (+) CD. The results indicate also that elders with smaller CD indicative present less symptomatology for DP. These results are coherent with researches that have estimated between 25-50% of the CD prevalence among the elders with DP [50]. However, to the establishment of a cause-effect relation, there is no consensus in literature. While Jorm [51,52] considers that there are not enough evidences to affirm that DP is a risk factor for DM or CD, others researchers point CD as a secondary alteration to DP [53]. Due to the characteristics of the researched elders and the MMSE limitations already pointed, we believe that DP, on this sample, is shown to be precedent to CD, which initially agrees with a tendency on the specialized literature that indicates DP as a risk factor for CD and DM [8,9,54-56].

Due to the high incidence of chronic diseases, 87,5% of the research subjects consumed some type of medicine. It was found an average of 8,6 continuous use medicine/elder/day from the medicated group, 9,7 medicine/female/day and 8,4 medicine/male/day, which corroborates others studies which reveal that the number of medicine utilized by elders admitted in nursing homes can be higher than seven by elder [57]. In addition, all the researched elders fit in polymedication [24,58-61] and chronicity [58,62] criteria of a larger.

The results show that 54,2% of the elders are submitted to psychopharmacotherapy and among all the medicine consumed, 17% was neuropsychiatric medicines [17%] and was constituted basically by ANX [4,4%], ANP [2,2%] and ADP [7,1%] and associations. Such results are alarming, considering that the consume of five or more

medicine per day and the realization of pharmacological treatment for three or more different health problems are considered to be risk factors for the emergence of problems related to medicines (PRMs) [23]. Other researches also have observed an increase in consumption of neuropsychiatric medicines on the elderly, estimating that the prevalence of these medicines among elders admitted in nursing homes reaches up to 63,0% [63].

Female elders consumed almost double of neuropsychiatric medicine per day than the male (relation of 1,8 by one), and this data corroborate the appointment made by other studies which attribute the female gender as a factor positively related to a higher consumption of medicines [21,22,25,64]. Furthermore, the neuropsychiatric medicines adopted for this sample follow the tendency pointed in the literature for the treatment of mood disorders in the elderly [65-67].

It is interesting to observe that, among the female subjects, even though is not statistically significant, there was a higher CD prevalence [61,6%] and lower DP prevalence [58,3%] if compared to the male subjects. Such results suggest that, for this sample, the polymedication and chronicity can be considered PRMs and risk factors for CD. In fact, as previously suggested, the elderly women are more polymedicated than the elderly men, and the polymedication among the elderly women have been associated to a worsening of the functional capacity as a result of CD caused by the medicine [68].

Nevertheless, one fact would put, in principle, this hypothesis in suspension: the results of this study indicated that elders medicated with neuropsychiatric medicines presented less DP (4,1% of the medicated against 12,5% of the non-medicated) and CD (4,1% of the medicated against 16,7% of the non-medicated) incidences in comparison with elders who were non-medicated. Meanwhile, an inverse effect occurs when the incidence of (+) DP (+) CD is evaluated; among the elders who were medicated with neuropsychiatric medicines, 33,3% presented (+) DP (+) CD, while that from the non-medicated only 16,7% presented (+) DP (+) CD. Thus, taken together, these results strongly suggest that the polymedication and chronicity can be considered PRMs and risk factors for neuropsychiatric disorders. In this sense, although some studies do not point out the association between the use of neuropsychiatric medicines and the prevalence of CD [69], other studies demonstrate this association [68]. Mental confusion and impairment in memory caused by attention deficit have been described as clinical consequences of the utilization of not only neuropsychiatric medicines, such as ADP, ANX and ANP, but also of other medicine classes, such as beta blockers [70] and antiulcers [71].

However, these findings are weakened again when we compare the general data of both groups (medicated and non-medicated with neuropsychiatric medicines) with the results of MMSE, because the results indicate that medicated elders present, in average, smaller CD prevalence (21,7 average/points/medicated against 19,9 average/points/non-medicated). Due to these results, should the correlation between psychopharmacotherapy and neuropsychiatric disorders be discarded? We believe that no if other factors are considered: the use of ANX isolated and the association between neuropsychiatric medicines.

In fact, individuals medicated only with ANX (benzodiazepines) presented, from the MMSE and GDS averages, CD and DP indicatives, which suggests that this type of medicine can be associated to the prevalence of such disorders. The ANX are Central Nervous System

depressor medicines and, due to this characteristic, it becomes a fundamental medication for anxiety treatment. However, it is exactly this Central Nervous System depression that negatively affect DP symptomatology among elders [72]. The chronic use of diazepam, a ANX, is directly related with the increase of symptoms of anguish, articular pains, depression and dizziness [71,73]. However, the utilization of other medicines, such as anti-hypertensives, is also related to the worsening of depressive symptoms among elders [71].

Furthermore, the CD and DP indicatives are elevated in elders using neuropsychiatric medicines associations. The association between antidepressants and antipsychotics increases the incidence of mental confusion among elders [71], what could be related to the increase of CD. Others associations that do not evolve neuropsychiatric medicine, such as cimetidine and captopril, also lead to mental confusion [71]. In addition, it have been also demonstrated that the depressive symptoms are significantly related with medicine associations [74]. It is clearly descripted in the literature that ANX, especially benzodiazepine, can have its depressor effect intensified by the concomitant use of ANP and ADP75. In this manner, taking also under consideration the neuropsychiatric medicines associations, the polymedication and chronicity as risk factors for CD and DP must be considered. Our results show that the higher the neuropsychiatric medicines associations, the higher are the prevalence for DP and CD symptomatology.

It is important to highlight as an aggravating factor for the exposed scenery, the fact that the elders to whom those associations are administrated already are highly emotional and/or physical and/or cognitive debilitated. Furthermore, it is important to point out that the elderly population presents physiological particularities that influence directly on the medicines' pharmacokinetics and pharmacodynamics [70,76]. These alterations, summed to polymedication (with the massive use of neuropsychiatric medicines) and chronicity, as previously presented, render the elders to be more vulnerable to PRMs occurrences, which elevates the mortality [25,64,70,77-80].

In this manner, the increase of CD and DP incidence among the studied elders can be considered, at least partially, as a consequence of the utilization of medicines. Furthermore, the MMSE and GDS tests applied to the elders medicated with neuropsychiatric medicine indicate that, the higher the symptomatology for DP, the higher the CD indicatives, which reinforces the DP as a risk factor for CD and DM [9,54-56,68].

Final Considerations

Other deeper investigations with larger samples and composed by elders resident in community and nursing homes with varied demographic characteristics are necessary to verify the coherence of these findings, and also to comprehend the nature of neuropsychiatric disorders on geriatric populations. Precise definitions and proper, sensitive and specific measurements are equally necessary for the comprehension of the nature of neuropsychiatric disorders in geriatric populations. The study of the relation between neuropsychiatric medicines associations and CD and/or DP must be deepened considering the pharmacological properties of the medicines and the context in which they are administrated. It is a fact that the medicines play a central role in the search for recovery of health and life quality, being an essential element of professional practices. However, the utilization of medicines must be considered by the health professionals as an additional tool, accessory to the steps of preventive feature and health promotion for the population, mainly in the elderly. On the other hand, there is no necessity for more studies to determine that elders admitted in nursing homes became weaker and, consequently, more susceptible to neuropsychiatric disorders. The solution is simple: a change of conjuncture (social, educational, political, and economical, etc.). The difficulty: implement them.

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