

## POPULATION EPIDEMIOLOGICAL STUDY OF DEMENTIA IN THE CITY OF LONDRINA- PARANÁ - BRAZIL

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**Abstract:** Brazilian society has undergone an important transformation in the profile of diseases, with a broad focus on chronic-degenerative diseases, especially among elderly patients, who are increasing in number, given the increase in global life expectancy. One of the examples of these chronic pathological conditions are dementias, frames of decline in cognitive ability with related functional dyers. The current work aims to project the number of elderly people in a state of dementia, through the prevalence of Alzheimer's Disease (AD) in Londrina, based on the distribution between several factors - age, sex, level of education, type of dementia, family history in first-degree relatives, risk factors and comorbidities presented. Previous studies have shown an increase in dementia with advancing age, with a predominance in females and a slight increase in black males. Brazil presented an average above world projections, being important more studies of the causes related to dementia and also the direction of care for patients who are at greater risk of developing it. AD, as well as other dementia syndromes, are embargoes for public health because they generate patients with loss of quality of life, autonomy and independence. These factors lead to an ethical and biopsychosocial issue: the patient's deficits make him fragile, increasing the risks of psychopathological conditions and also include the responsibility of the health system and family members as a form of care for individuals with dementia. The present work was approved by the Research Ethics Committee, with a careful evaluation of medical records and selection of the same for the composition of a spreadsheet, through which the epidemiological statistical analyzes were carried out. A total of 1469 medical records were collected, with results that indicated a higher prevalence, in the places, in the female gender and greater

amplitude of difference between 80 and 89 years of age. The combined prevalence of the evaluated centers was 44.70%, with Alzheimer's disease dementia being the most frequent, representing a value close to 90% of the total sample. Other analyzes were carried out, allowing a broader and more generalized observation of the specific-regional panorama of the two clinical centers observed.

**Keywords:** Epidemiology, Alzheimer's Disease, Vascular Dementia, Elderly, Brazil

## INTRODUCTION

Dementia syndromes have as a consequence the impairment of global functionality and autonomy, especially in the elderly, who are considered to be the main ones affected by this disease, since its prevalence increases with age. Dementias are a group of diseases whose effect is to affect brain functioning, including memory, reasoning, orientation, comprehension, calculation, learning ability, language and judgment.<sup>1,2</sup> Alzheimer's disease (AD) is the most common type of dementia among Western countries, accounting for about 60% of cases, while vascular dementia is second, with about 20% of all cases.<sup>3</sup>

The pathophysiological mechanism of AD is known. Neuropathological changes characteristic of AD are diffuse and neuritic plaques, marked by deposition of extracellular beta amyloid, and neurofibrillary tangles, composed by the intracellular accumulation of a protein under abnormal conditions, called hyperphosphorylated tau protein (p-tau). However, the area of epidemiological study of AD is being transformed by the availability of new biomarker technologies to measure such neuropathological changes in vivo. Large randomized clinical trials are evaluating anti-amyloid and other disease-based therapies for the treatment and prevention of AD using these imaging or cerebrospinal fluid biomarkers. (LCR).<sup>4</sup>

Added to the investments to discover new therapies and technologies for the treatment and prevention of AD, its relevance lies in its influence on the mortality of these individuals. Dementia is a common cause of death in older adults. In a Medicare survey of 22,896 adults age 65 and older, 15 diseases accounted for 70 percent of all deaths.<sup>5</sup> Dementia ranked second, after heart failure, as the leading cause of death, accounting for 19 percent of deaths.<sup>5,6</sup> Although individuals do not die of AD per se, advanced disease increases vulnerability to other disorders, commonly infections, which ultimately lead to death.<sup>6</sup>

The importance and objective of the present study lie in the fact that the literature found presents few epidemiological data regarding dementia in Brazil. The studies are mostly concentrated in the southeastern region of Brazil, more specifically in the states of São Paulo and Rio de Janeiro, while only one study was carried out in Mato Grosso do Sul.<sup>3</sup> In addition, the last study carried out was in the year 2012, in the city of Ribeirão Preto and no study was found referring to the state of Paraná, more specifically, in the city of Londrina. Added to this, and as a main element, the observation of the variables of patients diagnosed with Alzheimer's allows us to identify the risk factors related to the development of these dementias, with the aim of recognizing those that are potentially modifiable, so that campaigns can be developed. of disease prevention, in addition to training health professionals for the insertion of screening programs and guidance strategies for the prevention of such risk factors.

## **MATERIALS AND METHODS**

### **ETHICAL ASPECTS**

The present study was carried out after approval by the Research Ethics Committee, under number 30025120.7.0000.0020, on

March 30, 2020, upon release of the same for data collection without the written signature of the participants, since the collected data are only quantitative, without evaluation of any identifying factors. Therefore, the release took place after a detailed explanation of its development, in accordance with resolution number: 466/2012 of the National Health Council and Declaration of Helsinki.

### **SAMPLE**

This study is characterized as a cross-sectional and cohort study - being a study of prevalence and incidence of dementia - and was developed at the Pontifical Catholic University of Paraná, Campus Londrina, located in the city of Londrina, Paraná, Brazil. Based on 2 (two) health centers that provide care in the city, samples were collected from medical records from these centers, and all medical records were carefully evaluated for the selection of valuable records for the study, patients who present consultations in 2019 who had or were diagnosed with some form of dementia.

The medical records that presented diagnostic doubts and that presented other pathologies not related to dementia syndromes were excluded from the group. In addition, repeated medical records of patients who had already been accounted for in the data sheet performed were excluded.

### **COLLECTION PREPARATION**

After determining the selection criteria for the sampled data, a spreadsheet was created with the objective of gathering all the information collected. Thus, the data evaluated in each medical record were: date of birth, age, education, gender, type of dementia, degree of dementia (CDR), comorbidities (dyslipidemia, arterial hypertension, diabetes and cerebrovascular accident - CVA), medications used continuum for dementia,

family history of dementia, smoking history, alcohol consumption history, clinical center of care, and year of diagnosis.

In addition, meetings were held with each clinical care center to familiarize the team, fill in the documents for accessing medical records and analyze the center's relevance to the study.

## DATA COLLECTION

Manual data collection was performed, with careful analysis of all medical records of patients treated by doctors who have specialties related to patients with dementia syndromes - neurology and geriatrics. Initially, the collection took place at the academic outpatient clinic of the PUCPR Londrina School of Medicine, with the collection of half of the medical records of the place. Thus, with the help of collaborators, the collection of all medical records from the Policlínica Municipal de Londrina was carried out, and then the collection was finalized at PUCPR Londrina.

Due to the COVID-19 pandemic, the format of the medical records and technical problems at the centers, it was not possible to collect data at the Hospital das Clínicas de Londrina and Cismepar, so that, in total, 1469 electronic medical records were evaluated.

The collections took place with the analysis of relevant data - from the medical records selected after application of the exclusion criteria - and completion of the previously organized worksheet, with records that did not meet the eligibility criteria being discarded. The worksheet was prepared in duplicate, for greater reliability of the results.

## STATISTICAL ANALYSIS

After the end of the collections, the worksheet was updated and revised, and then the data obtained were divided into some categories: age group – below 60 years; from

60 to 69 years; from 70 to 79 years; from 80 to 89 years and over 90 years; clinical center – PUCPR and Polyclinic; family history of dementia – positive, negative and without data; type of dementia – Alzheimer's; Lewy bodies; Parkinson's; Vascular and Mixed; CDR – no data information; 1 (light); 2 (moderate) and 3 (severe); continuous use medications – rivastigmine; donepezil; galanthamine; memantine and without the use of medication; personal history of alcoholism; personal smoking history; education level; genre; comorbidities – diabetes mellitus (DM2); arterial hypertension (SAH); stroke and dyslipidemia (DSLIP); year of diagnosis – year in which the first medical record with a concrete diagnosis of dementia appears and treatment started.

Categorical variables were expressed as absolute number (n) and percentage (%). The degree of association between the variables was assessed by bivariate correlation analysis (Pearson). Statistical analysis was performed using SPSS for Windows, version 22.0 (SPSS Statistics, Chicago-IL, USA) and the significance level was defined as  $p < 0.05$ .

## RESULTS

A total of 1469 medical records were evaluated, including the Geriatrics and Neurology outpatient clinic of the Pontifical Catholic University of Paraná - Londrina and the Municipal Polyclinic of the city of Londrina, of patients who presented consultations in 2019 who had a previous diagnosis or who were diagnosed with some type of dementia. When the exclusion criteria were applied, a total of 658 patients remained.

From the evaluated sample, there was a higher prevalence of diagnoses in females, in relation to males, at all ages; this discrepancy between 80-89 years is more evident. Table 1 shows that 60.8% of diagnoses considering the total sample are in females, versus 39.2% found

in males. In addition to this information, it was possible to observe that the number of diagnoses of dementia increases considerably with age, especially between the ages of 60 and 89 years, with a decrease in diagnoses when patients are over 90 years old, in both sexes, and a peak of 80-89 years. The result is illustrated in Graph 1, which demonstrates the number of patients diagnosed with dementia, distributed according to age groups and sex.

Regarding the result of the total prevalence of dementia in the city of Londrina, it was not possible to estimate it due to the small sample size. In this scenario, it was possible to find the prevalence in the services where the collection was possible - the Geriatrics and Neurology outpatient clinic of the Pontifical Catholic University of Paraná (PUCPR) and the Municipal Polyclinic of the city of Londrina. Based on the sample of medical records that presented the diagnosis of dementia in these services, a prevalence of 11.18% was calculated in the outpatient clinics of PUCPR and 60.80% in the Policlínica Municipal de Londrina. The combined prevalence rate of the two centers studied was 44.79%.

Analyzes were performed regarding the subtypes of dementia found in the studied sample ( $n = 650$ ), excluding those records that did not contain this information, as also shown in Table 1. Alzheimer's Disease (AD) stood out as the main among the observed, representing 82% ( $n = 533$ ) of the total. In second place, Mixed Dementia (DM) stood out, totaling 7.1% of diagnoses, showing a significant difference in relation to AD. Vascular Dementia (VD) represented 5.8% of the total, leaving, finally, Dementia with Lewy Bodies and Dementia associated with Parkinson's Disease, which represent 3.4% and 1.7% of the diagnoses in the analyzed sample, respectively.

Still in Table 1, it is possible to observe that the number of diagnoses and their percentage

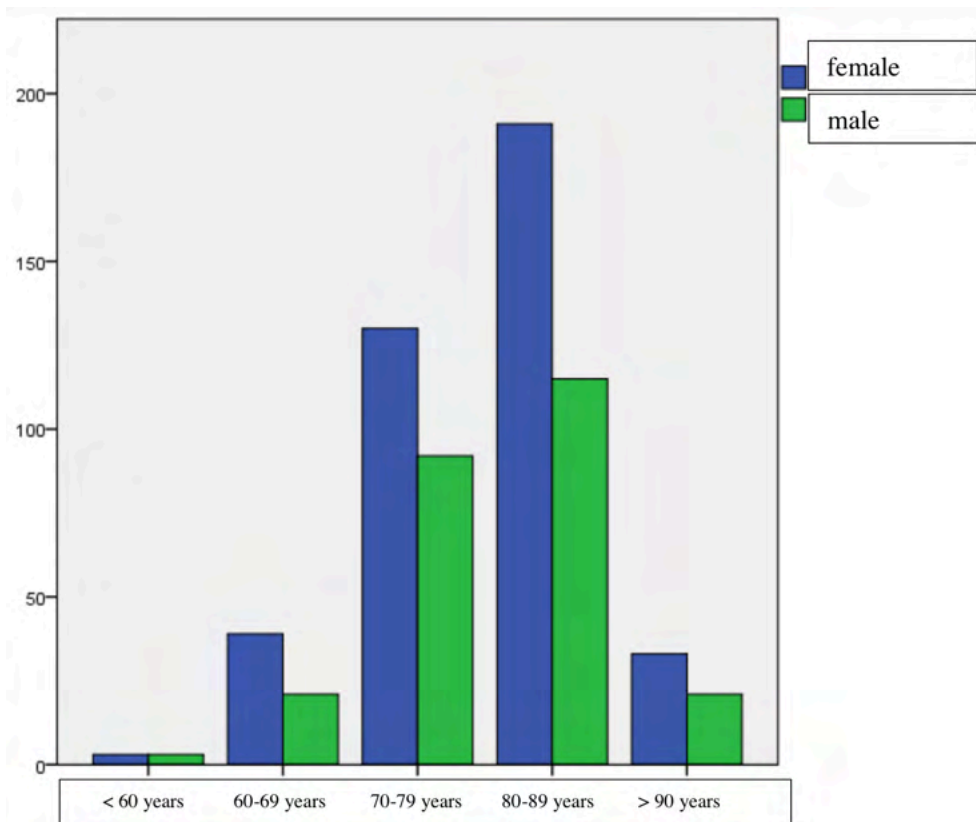
decrease as the level of education increases. However, when we applied the chi-square test on the outcome of the development of Alzheimer's Disease - the most common one - no dependence relationship was found between the level of education and AD ( $p > 0.05$ ). The same test was applied to the other subtypes of dementia and the same result was found.

In a comparative and correlation analysis between men and women in relation to the education variable, tests were performed to identify a possible relationship between education level and the risks of diagnosing dementia. Through the research, it was not possible, however, to identify a significant difference, both for females and males, between these factors. Therefore, in the sample represented by the study, the patients' level of education and dementia did not indicate a significant relationship, with  $p > 0.05$ .

In our study, we sought to establish a relationship between possible risk factors and the development of dementia. True and important associations were found between Vascular Dementia and previous stroke history ( $P = 0.56$ ;  $p = 0.00$ ), with systemic arterial hypertension ( $P = 0.1$ ;  $p = 0.01$ ), with dyslipidemia ( $P=0.09$ ;  $p=0.03$ ), but not with diabetes mellitus (DM2). Alzheimer's Disease (AD) presented a positive correlation only with the risk factor of previous CVA ( $p = 0.00$ ). In the same way, Mixed Dementia raises the hypothesis of previous CVA as a risk factor for its development ( $p = 0.00$ ). Dementia due to Lewy bodies seems to have a true association with the presence of systemic arterial hypertension (SAH). No associations were found between AD and comorbidities such as SAH ( $P = - 0.07$ ;  $p = 0.09$ ), DM2 ( $P = 0.02$ ;  $p = 0.56$ ) and dyslipidemia ( $P = 0.04$ ;  $p = 0.92$ ) in our sample. This information can be seen in Table 2.

	n	%
<i>Gender (n=658)</i>		
Female	400	60,8
Mae	258	39,2
<i>Education (n=539)</i>		
Illiterate	150	27,8
1 (1-4 years)	278	51,6
2 (5-8 years)	70	13
3 (9-11 years)	24	4,5
4 (> 11 years)	17	3,2
<i>Type of Dementia (n=650)</i>		
Alzheimer	533	82,0
Lewy	22	3,4
Parkinson	11	1,7
Vascular	38	5,8
Mixed	46	7,1
<i>Age (n=658)</i>		
No information	10	1,5
< 60 years	6	0,9
60-69 years	60	9,1
70-79 years	222	33,7
80-89 years	306	46,5
> 90 years	54	8,2
<i>CDR (n=519)</i>		
1	278	42,2
2	178	27,1
3	63	9,6

Table 1. Clinical-demographic data of the patients in the study.



Graph 1. Number of patients diagnosed with dementia, divided by age groups and male and female gender.

		HAS	DSLIP	DM2	AVE
Alzheimer	Pearson	-0,07	0,04	0,02	-0,27
	p	0,09	0,92	0,56	0,000*
Lewy	Pearson	-0,10	-0,06	-0,04	-0,03
	p	0,01*	0,12	0,37	0,40
Parkinson	Pearson	0,07	-0,07	-0,06	-0,01
	p	0,08	0,07	0,12	0,90
Vascular	Pearson	0,10	0,09	0,07	0,56
	p	0,01*	0,03*	0,10	0,000*
Mixed	Pearson	0,04	0,06	0,06	0,38
	p	0,30	0,13	0,17	0,000*

Table 2. Correlation between the type of dementia and the presence of comorbidities.

The observation of the correlation between the development of dementia and unfavorable lifestyle habits, such as smoking and alcohol consumption, demonstrated some possibilities. There was a trend of correlation between smoking ( $P=0.105$ ;  $p=0.08$ ) and alcohol consumption ( $P=0.11$ ;  $p=0.07$ ) with the presence of vascular dementia.

Among the data evaluated, it was also possible to observe an important relationship between the age of patients diagnosed with Alzheimer's dementia and the CDR, or Clinical Dementia Score. In view of the results obtained, an important increase in CDR was noted in older age groups, noting - in the evaluated sample of 516 patients with Alzheimer's dementia - risks of greater CDR, or more advanced disease, in patients with more advanced ages ( $P=0.195$ ;  $p=0.00$ ). The analyzes carried out also identified a correlation between the CDR and the most used drugs for AD, in the clinical centers evaluated. With this, it was possible to observe that there is a trend in the use of memantine in cases of Alzheimer's Disease with higher degrees of evolution - higher CDR -, followed by the drug quetiapine ( $P=0.39$ ;  $p=0.00$ ); ( $P=0.32$ ;  $p=0.00$ ), with respective indices that represent a weak correlation of the analysis.

As a result of the study, a possible correlation between the drugs used and the types of dementia presented in the collected sample was also identified. From the analyses, about Alzheimer's Disease, a weak, but existing, correlation was demonstrated with the use of donepezil ( $P=0.25$ ;  $p=0.00$ ), followed by the use of memantine ( $P=0.94$ ;  $p=0.01$ ). When dealing with vascular dementias, the results seem to indicate a greater use of galanthamine ( $P=0.08$ ;  $p=0.03$ ) when compared to the use of donepezil ( $P=-0.12$ ;  $p=0.00$ ).

## DISCUSSION

Epidemiological knowledge about dementia is important because it allows a comparative analysis with other regions and the collection of data and hypotheses that establish the presence of risk factors or protective factors, in addition to helping to direct public policies towards a qualified approach. of this pathology. The city of Londrina showed some convergent and other divergent points in relation to existing studies.

The association between the age risk factor and the development of dementia is clear and is in agreement with what was found in other regions of Brazil and the world. According to Burlá C et al., a characteristic observed in eight Brazilian locations - Catanduva, Piraju, São Paulo, Butantã District, Ribeirão Preto, all in the State of São Paulo, plus Santa Cruz, Rio Grande do Norte and Campo Grande, in the Mato Grosso do Sul - the world and Latin American average is that the prevalence of dementia grows sharply with age, ranging from 0.12% in the age group from 65 to 69 years in Piraju (SP) to 77.8% among 90 to 94 year olds from the Japanese community of Campo Grande.<sup>4</sup> In these results, the same drop in diagnoses of dementia was not observed from the age of 90, as was seen in the city of Londrina, given that the diagnoses kept increasing until the age of 94. There are some hypotheses that explain this drop in diagnoses from the age of 90: the most likely is that there are fewer nonagenarians in the age pyramid of Londrina than in Campo Grande. Another possibility is the lack of access to the Public Health System by these elderly people, who are neglected and end up not receiving adequate diagnosis and treatment.

While our study found a prevalence rate of diagnoses of 60.8% in females versus 39.2% in males, in the study by Burlá C et al, a difference between males and females was also observed, although not so discrepant.



Among men, prevalence rates ranged from 4.2% in the Butantã District of São Paulo to 11.4% in the Japanese community of Campo Grande. For women, this variation was more expressive, from 2.2% in Piraju (SP) to 12.6% in the Japanese community of Campo Grande. In all areas studied, the prevalence rate was higher among women.<sup>4</sup> On the other hand, a review on the prevalence of dementia in several cities in the country, despite stating that the association with gender is positive, states that in some studies, it presents- if negative, in order to state that it is not possible to establish gender as a factor associated with dementia.<sup>2</sup> The study by Coelho et al., tried to assess whether this difference between men and women is due to the higher level of education among men. It was observed that the significant differences between men and women detected through the Student's t test are associated with the level of education of the sample studied. However, other recent studies show that women have more dementia, even with the same level of education. Such divergence of results demonstrates the need for more research.<sup>27</sup>

Due to the fact that it was not possible to estimate the prevalence of dementia diagnoses in the city of Londrina, it was not possible to draw a comparison with existing studies. Corrêa et al., in their study carried out in the city of Rio de Janeiro, with a sample of 683 subjects aged 67 years or older - clients with a private health plan, found a prevalence of 16.9%; while in the study by César et al, the prevalence found in the city of Tremembé, with 630 subjects aged 60 years or older, in 2010, was 17.5%. Added to studies from other regions of the country, such as the cities of São Paulo, Catanduva, Campo Grande, among others, the average prevalence among these studies is 11.15%, despite having a wide range (5.1% to 17, 1%).<sup>2</sup> The prevalence found in these centers was based on a large sample, in

places not only aimed at the care of the elderly or the diagnosis of dementia. Therefore, when performing a comparative tracing with the prevalence found in the services evaluated in our study, it is noted that we present a higher prevalence. According to Burlá C et al., the average crude prevalence rate observed for Latin American countries was 7.13%.<sup>4</sup>

Under the analysis of the most common dementia subtypes, the city of Londrina follows the patterns demonstrated by existing research in Brazil. A large number of studies and reviews present AD as the most prevalent subtype of dementia, despite the variability of rates worldwide. Brazilians tend to have a higher prevalence of AD, which is a pattern found in developed countries.<sup>2</sup> In the second most prevalent type, Mixed Dementia stood out, and studies in other Brazilian cities studied demonstrate a conflict of this position between Mixed Dementia and Vascular Dementia. Studies carried out in the city of São Paulo and its metropolitan region (SP), Rio de Janeiro (SP) and Ribeirão Preto (SP), found the second most prevalent subtype to be Mixed Dementia. According to the studies by Yamada et al and Herrera et al, in two cities higher prevalences of DM were found instead of VD as the second most prevalent type, namely Campo Grande (-MS) and Catanduva (SP), with approximately 40% of cases. DM and 14.5% of DM, respectively, which - despite being the minority of cases - converged with the data found in the current study. These factors allow us to conclude that the most prevalent subtype in Brazil tends to be consolidated, however there is an alternation in relation to the prevalence of other groups of dementia, especially mixed and vascular.

A study that observed the prevalence of dementia in different regions of the world observed that Alzheimer's disease (AD) was more prevalent than vascular dementia (VD) in all regions surveyed, especially the South

American study (Brazil), which presented a result 2 to 3 times higher than the other regions. However, an important reversal of this relationship occurred in 30% of Asian studies, with the prevalence of VD reported as 2 times higher than that of AD.<sup>25</sup> In the USA, a higher proportion of VD than AD was found, however, this may be explained by the fact that this sample had a high proportion of black individuals, corroborating the findings of HEYMAN et al, who detected a higher proportion of VD in blacks.<sup>26</sup>

The elucidation of risk factors directly related to the development of dementia is still not clear and not subject to generalization. Observational studies point to the existence of an association between cerebrovascular events with Vascular Dementia (VD), and controversial results regarding AD. The comparative clinical case study by MORTEL et al (1993) observed an increased risk of ischemic VD, and not of AD, among patients with arterial hypertension and diabetes mellitus. According to TATEMACHI et al. (1993), after performing cross-sectional observations of patients with a history of stroke, found an association of dementia with previous stroke and diabetes mellitus, and not with arterial hypertension and heart disease.<sup>26</sup>

The establishment of a relationship between unfavorable lifestyle habits, such as alcohol consumption and smoking, and the increased risk of developing dementia was also not obvious. In our study, a correlation trend was found with Vascular Dementia, which raises the possibility of discovering risk factors that are modifiable. However, there were no linear relationships between these habits and the dementias associated with Alzheimer's Disease, Mixed Dementia and the others analyzed. According to HULSE et al, there is no linear relationship between alcohol use and dementia, but, according to MIKAMAL et al, there is a lower risk if intermediate doses

- 1 to 6 doses/week, and an increased risk in those who are abstinent or amounts greater than 14 doses/week.<sup>26</sup>

Regarding the analyzes that involved the scales or clinical score of Alzheimer's dementia (CDR), the products of the analyzes identified the expected result of a greater presence of advanced degrees of the disease in higher age groups. It is likely that patients who develop dementia at an earlier age have more time for the disease to progress and, therefore, increase the risk of increasingly advanced disease, consistent with advancing age. In addition, still on the analyzes involving the CDR score, there were indices that showed memantine as the drug most used in moderate and severe cases, since its mechanism of action promotes antagonism in a non-competitive way of NMDA receptors, in a moderate and dependent way. voltage, a fact also reported in a study by Engelhardt et al., 2005. Added to this factor, quetiapine, an atypical psychotic agent, acts especially in more advanced cases - which present greater episodes of irritability, sleep disturbance -, through interaction with neurotransmitter receptors with the aim of performing mild catalepsy. This factor explains the higher prevalence of its use proportional to the evolution of the CDR.

In their study, Engelhardt et al., evaluated an important efficacy in improving behavioral and psychological symptoms, and also a slight improvement in cognitive symptoms caused by AD after the use of anticholinesterase drugs (IChEs) - donepezil, galantamine. In the current study, the outcome of the collection indicated a greater use of donepezil in patients with AD, and in many cases in the sample there is an association between the use of memantine and donepezil, evaluated as an additional benefit by the 2005 study. Ministry of Health of Brazil, the Clinical Protocol and Therapeutic Guidelines for Alzheimer's Disease, 2017, suggests multidisciplinary

treatment with the association of cholinesterase inhibitor drugs for AD with CDR indicating mild or moderate disease, with meta-analysis studies and systematic reviews that indicate the action of these drugs in improving cognitive and functional symptoms - the evaluated drugs were donepezil, galantamine and rivastigmine, without superiority. Also in this protocol, the evidence of a beneficial association of memantine with these drugs is cited, assuring the results obtained in the current analysis and by Engelhardt et al.

In cases of vascular dementia, Brucki et al. found a lack of data for the use of cholinesterase inhibitor drugs and glutamatergic receptor antagonists, and, according to the study, donepezil proved to be tolerable in the sample, and the use of galantamine showed benefits especially for mixed dementia - for vascular dementia, however, the effectiveness was limited. In addition, the data resulting from the analysis of the correlation between memantine and vascular dementias were insufficient and, therefore, without further definitions. In the present study, despite these analyzes by Brucki et al. (2011), it was possible to verify that, in the clinical practice of the sample group, the use of galantamine both for mixed dementia and for vascular dementia is performed, indicating a possible beneficial action on the cognitive conditions of these patients. Added to this, the existing amplitude between the use of galantamine and donepezil for such types of dementia - vascular and mixed - is possibly due to the fact that they are drugs recommended in the package insert for treatments. As in the observation made in 2011, not enough data were found to justify the use of memantine in cases of vascular dementia.

In view of the analyzes carried out to verify the relationship between the evolution of dementia and the level of education, it was identified that, in the collected sample, other

unassessed factors may be a priority on this issue, requiring further studies to compare education with emotional factors, functional and others that can be identified as risk factors for the development of dementia. In addition to the results found, Coelho et al. (2010) identified, through several tests - albeit through a limited sample -, in the patients of the study, an important indication of the action of other factors that may predispose patients to deficits. In the study by Coelho et al, patients were submitted to several tests, verbal and non-verbal, and the prevalence of these deficits after their retirement was observed, in large numbers in the male sample, with feelings of worthlessness and loss. of personal values. In females, the study observed that these rates were different, since many women were not in the habit of having their work environment outside the home. Thus, there were more positive references to their domestic activities, when compared to those collected by men. In conjunction with these results, it is of fundamental importance that, in the verification of dementias and their interconnected factors, the observation is multifactorial and broad, in order to correlate different situations that can serve as trigger points in these patients.

## CONCLUSION

Despite a limited sample - which restricts the global application of the results, associated with the fact that the centers used to collect analysis material are services aimed at caring for elderly people with dementia - which resulted in high prevalence rates of patients with this diagnosis found in our study, with results of 11.18% and 60.80%, in PUCPR and Policlínica Municipal de Londrina, respectively.

It was possible to observe that Alzheimer's dementia was the most prevalent when compared to other types of dementia, followed

by DM and VD, suggesting a direction for new therapies and public policies that can reduce risk factors, since dementias cause in great deficit for patients and the general population. Added to other Brazilian prevalence studies on dementia, the indices also indicate that, in all places, females are more predisposed to these pathologies, requiring more data to justify this factor.

Regarding the aspects of comorbidities, there were no different results from previous studies that could change the look of a posteriori research, however it is important to emphasize that the factors analyzed - hypertension, diabetes mellitus, dyslipidemia and stroke - showed different degrees of correlation, which makes inconclusive the real character of association between them and the dementias evaluated, with the exception of the clear relationship between CVA and vascular dementias.

Finally, the scarce number of Brazilian epidemiological studies that fit the comparisons discussed in the research is evident, so that all data are based on limited samples, making it difficult to generalize the results obtained. With this, it is suggested to encourage and support new research involving the study of dementia in Brazil, with the objective of further concretizing the information present in this study, in an even more comprehensive way, and that serve as a structure for carrying out further research. new searches for social and therapeutic interventions in order to reduce the high prevalence and morbidity resulting from dementia syndromes. Furthermore, it is concluded that Londrina presents, as an estimate from the centers evaluated, a pattern closer to that of developed countries, and with treatment within the most recent protocols developed by the Ministry of Health of Brazil.

## FINAL CONSIDERATIONS

The present study aims to provide an estimate of the number of elderly people diagnosed with dementia over the total population at risk for this pathology, through the application of statistical analyzes on the collection of 658 medical records of patients with dementia in two centers of specialized service, in the city of Londrina. Based on this estimate, the objective is amplified when we look at the quantitative importance of dementia for this population at risk. As we observe that a large part of the elderly population shares this same health condition, the objective extends to directing the attention of the Public Health Service to these elderly people who suffer from this pathology, even within the Primary Care itself.

As said, there are few epidemiological studies in isolated cities in Brazil, which discourages investment in this sector. Despite the scarce data available for comparative analysis, it was possible to perceive that our sample shares the same results in the aforementioned situations, such as the fact that age is a potential risk factor, as well as the history of previous stroke - both for Vascular Dementia, as for Alzheimer's Dementia; the fact that there is a higher prevalence in females and that AD is the most common subtype. On the other hand, the claim that education is a risk factor is controversial, as is the association of alcoholism and smoking with the development of this pathology.

Regarding the prevalence results, it is important to highlight the difficulty encountered in carrying out the collections in the face of the COVID-19 pandemic, which resulted in a more restricted sample and only from specialized clinical centers aimed at the care of elderly people with dementia - such as the Policlínica Municipal de Londrina and the Geriatrics and Neurology Outpatient Clinics at PUCPR. In addition, this difficulty

justifies the high prevalence rates found in these centers, compared to the prevalences reported by the few studies found in Brazil in the aforementioned cities.

In short, there is a clear need for new studies that seek to prove the risk factors that are still uncertain, so that we can invest in primary prevention of the development of dementia, as well as an expanded approach from Primary

Care to this population at risk, regarding the evolution of dementia, especially Alzheimer's disease.

## **PARTICIPATION OF AUTHORS IN THE TEXT**

The authors participated in all stages of the research equally.

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