RESEARCH ARTICLE   **OPEN ACCESS**

VASCULAR DEMENTIA AND ITS IMPLICATIONS: CONTRIBUTIONS TO COLLECTIVE HEALTH IN BRAZIL

Gabriela Cristina da Silva Caldeira[1] and Denise Regina da Costa Aguiar[2]

[1]Student of the Medicine course at the Universidade Brasil, Fernandópolis, Brazil
[2]PhD in Education, Professor at the Master's Program in Environmental Sciences, Universidade Brasil, Fernandópolis, Brazil

ARTICLE INFO

ABSTRACT

Vascular dementia is part of a brain disease group called dementia. This cerebrovascular pathology is the second most frequent among diseases that make up this group, second only to Alzheimer's disease. Among the causes that motivate the emergence of this disease, there is systemic arterial hypertension, atherosclerosis, diabetes mellitus and advanced age. Thus, this study aimed to understand the factors that trigger the development of vascular dementia, in addition to its implications and repercussions on the life quality of both the affected individual and family members. We sought to investigate diagnoses and treatments to understand other aspects that are associated with vascular dementia. The research was developed using a qualitative approach, with a bibliographical study on the subject in books and scientific journals. We concluded that dementia mainly affects the elderly, requiring an attentive care aimed at this public. With that, family members, caregivers and health professionals should be aware of the first symptoms and care that patients need, as there must be a broad and multidisciplinary treatment. We were able to verify that there are modifiable factors in old age that prevent and/or minimize symptoms, such as: physical exercise, cognitive training, diet, social context, emotional state and cardiovascular factors.

INTRODUCTION

Dementia encompasses several classes of brain diseases that have characteristics that evolve over time and cause harm to individuals. Among these diseases, there is vascular dementia, which has several causes, including diabetes mellitus, atherosclerosis, systemic arterial hypertension and age Santos, Bezerra*et al.*, 2018. Studies show that vascular dementia accounts for 20% of cases of dementia, second only to Alzheimer's disease, which corresponds to 80%, and is therefore the most common Souza*et al.*, 2020. Among the symptoms present in this pathology, there are amnesia, aphasia, apraxia, agnosia or executive dysfunction, hence the diagnosis is based on the presence of the neurological signs and the symptoms mentioned, in addition to neuroimaging Engelhardt *et al.*, 2011. Vascular dementia results from vascular alterations, being mainly a consequence of strokes hemorrhagic or ischemic. and injuries caused by thrombi or emboli Severiano, 2019. Diabetes mellitus is one of the causes that lead to the development of the pathology addressed, thus there are studies that show a relationship between both Medrano *et al.*, 2021.

The cerebrovascular disease addressed can be subdivided into: post-cerebral infarction vascular dementia classified according to the type, nature and dimensions of the cerebral infarction. and subcortical ischemic vascular dementia lacunar state and Binswanger's disease. In addition, another cause of vascular dementia is atherosclerosis, which increases the risk of vascular damage Nunes, 2015. Furthermore, studies indicate other symptoms that identify cerebral vascular damage in patients with vascular dementia, which are used to diagnose such affected individuals. These symptoms are: early gait changes, urinary urgency/incontinence, pseudobulbar palsy, personality changes and depression Ionel, 2015. Consequently, the diagnosis is of great importance, as in addition to confirming an illness to the patient, it also brings benefits to family members and caregivers, as behavioral changes will be addressed, the consequences they will develop and, from this, the treatment will be effective and adopted in its entirety, ultimately bringing a good quality of life to the patient Teldeschi *et al.*, 2018. With this, it is essential that the elderly have psychological support, both from their family and from professionals, since dementia can generate anguish and depression due to the loss of basic functions Brum *et al.*, 2013. including difficulties with eating, drinking and walking Lopes *et al.*, 2020.

In terms of treatment, there are two approaches: pharmacological and non-pharmacological. The drug treatment has three main drugs, namely: donepezil, galantamine and rivastigmine, which are acetylcholinesterase enzyme inhibitors. Non-drug treatment, on the other hand, encompasses multidisciplinary care, in addition to changing patients' habits Furtado *et al*., 2021. Among the multidisciplinary professionals who work to improve the quality of life of patients, occupational therapists perform fundamental activities for recovery of movement and memory, for example. One study showed that there was improvement in memory and attention in 90.9% of participants, including performance and cognitive activities and everyday situations Raymundo *et al*., 2017. Other professionals who work together with occupational therapists are physiotherapists, who help, for example, in the prevention and re-education of motor coordination movements, such as maintaining a vertical posture and performing muscle contractions, which, when weakened, slow down the movement of the elderly Henriques, 2013. There are also psychologists, who help patients and their families. They are extremely important during treatment, as they are responsible for assessing the symptoms presented, behavioral changes, developing interventions and promoting cognitive stimulation activities. Thus, along with those responsible for the elderly, they are able to promote actions that improve the quality of life of those affected with vascular dementia Jesus, 2016. In addition, it is of great importance that palliative care is also included, which addresses the individual as a whole. This care integrates physical, psychological, social, family and spiritual needs and aims to minimize the symptoms resulting from vascular dementia, thus promoting a better quality of life Rodrigues *et al*., 2020. The present study investigated the causes and consequences of vascular dementia, demonstrating its repercussions on the most affected population, in addition to illustrating current diagnoses and treatments.Thus, we sought to clarify the aforementioned aspects, not only for health professionals, but also for the population in general, since it is an important public health problem.

MATERIALS AND METHODS

The option for the methodology of the work was defined by a qualitative investigation of bibliographic nature. ToGil 1999. , the use of a qualitative approach provides a deeper investigation of issues related to the phenomenon under study and relationships, by valuing direct contact with the studied object.Qualitative studies, toDenzin and Lincoln 2006. , are useful for diagnosing situations, exploring alternatives or discovering new ideas. ToLakatos and Marconi 2003. , bibliographical research encompasses a bibliography already made public in relation to the subject of study, and it aims to put the researcher in direct contact with everything that has been written and investigated. Having said that,the research was carried out through a bibliographic review, with data collection in articles and journals present in virtual databases sites. of research, such as SciELO, Google Scholar and MedLine.

RESULTS AND DISCUSSION

The research with bibliographical studies began through a search with the keywords: vascular dementia, causes, treatment and diagnosis. For this search, the following sites were accessed: SciELO, Google Scholar and MedLine, and a total of 12 papers were found.Among the papers, 7 studies were selected, between the years 2010 and 2022, which contributed to the understanding of the causes, diagnoses and treatment of Vascular Dementia.Table 1 shows the year, title, authors, journal, location and description of the selected papers. Araújo and Nicoli 2010. aimed, through a bibliographic review, to identify and present the scientific production related to the theme, from 2000 to 2010.According to the authors: "Dementia can be defined as a syndrome characterized by progressive and global decline in memory, associated with a deficit in one or more cognitive functions" Araújo and Nicoli, 2010, p. 33. and can interfere with the social and/or occupational life of the individual.

In addition, the development of dementia causes limitations in the individual's daily life, with cognitive difficulties, emotional and behavioral disorders Araújo and Nicoli, 2010. For the diagnosis, it is necessary to observe some criteria, which include memory impairment associated with another cognitive disorder such as: apraxia, agnosia, and aphasia, which directly interfere with the individual's autonomy and the finding of deterioration or cognitive decline in relation to the previous condition of the individual Araújo and Nicoli, 2010. Besides, Araújo and Nicoli 2010. observed that the etiological diagnosis based on laboratory tests, neuroimaging, with the verification of the characteristic neuropsychological profile is fundamental. These aspects are important for the differential diagnosis of the types of dementia, which include Lewy Body Dementia LBD. , Frontotemporal Dementia FTD. , Vascular Dementia VD. and Alzheimer's Disease AD. Fornari *et al*. 2010. carried out a bibliographical study, through the Medline, Ovid and Scopus databases until October 2009, as well as textbooks, with the objective of understanding the clinical aspects related to the different dementia syndromes and knowing the differences that permeate the diagnosis.The authors highlighted in the literature several proposed classifications for dementia syndromes. A commonly adopted classification is that which distinguishes two groups: the group of degenerative or primary. dementias, which includes AD, Lewy Body Dementia LBD. and Frontotemporal Dementia FTD. , among others; and the group of non-degenerative or secondary. dementias, which includes numerous subtypes, with emphasis on Vascular Dementia VD. , Prion Dementia, Hydrocephalus Dementia, dementia due to intracranial expansive lesions and Toxicometabolic Dementia. Fornari *et al*., 2010, p. 186. However, for a better understanding and didactic organization, based on the literature review carried out, the authors proposed a different classification for dementia syndromes.They have "distinguished two quite heterogeneous groups: that of irreversible dementias, a group that includes degenerative dementias, in addition to vascular and mixed dementia; and that of reversible dementias groupwhich represents part of non-degenerative or secondary dementias" Fornari*et al*., 2010, p. 186. According to the authors, the only irreversible dementia that can be prevented is Vascular Dementia VD. Fornari*et al*., 2010. VD occurs in the heterogeneous cerebrovascular disease, being the second cause of dementia in the Western world Fornari*et al*., 2010. According to the authors, the suggested diagnostic criteria for VD are: 1. clinically and neuropsychologically confirmed dementia syndrome; 2. focal neurological signs hemiparesis, ataxia, hemianopia. or focal neuropsychological changes such as aphasia and hemineglect. ; 3. vascular lesion evidenced by neuroimaging; 4. relationship between dementia and cerebrovascular disease established within three months after the stroke or abrupt cognitive deterioration with progression in stages. Fornari*et al*., 2010, p. 188.

The study pointed out that the diagnostic process of dementia syndromes occurs fundamentally in clinical practice, requiring anamnesis, complete physical examination, standardized cognitive and neuropsychological tests Fornari*et al*., 2010. Finally, the authors noted that neuroimaging and laboratory tests are essential to determine the underlying cause of the dementia condition, highlighting the peculiarities that differentiate the diagnosis. They pointed out that the definitive diagnosis for degenerative dementias requires histopathological analysis of autopsy materials Fornari*et al*., 2010. The research conducted by Parmera and Nitrini 2015. aimed to understand the types of diagnoses of dementia and how new techniques can help for a more accurate and precise assessment. The authors showed that vascular disease is a more identifiable risk factor for dementia, as well as age, and should be controllable.According to the authors:

Currently, the most accepted criterion for vascular dementia is that of the *National Institute of Neurological Disorders and Stroke – Association Internationale pour la reserche et L'enseignementen Neurosciences* NINDS-AIREN. , in which state that there must be dementia, associated with a cerebrovascular disease – this, in turn, defined by the presence of alterations to the neurological exam or through exams of image – and a relationship established between both.

Table 1. Studies on causes, diagnosis and treatment

	Year	Title	Authors	Journal	Location
1	2010	A bibliographic review of the main dementias which take on the Brazilian population	Araújo,C. L.deO.,and Nicoli, J. S.	Revista Kairós Gerontologia	São Paulo, Brazil
2	2010	The several faces of dementia syndrome: How to diagnose clinically?	Fornari, L. H. T.et al.	Scientia Médica	Porto Alegre, Brazil
3	2011	Treatment of vascular dementia	Brucki, S. M. D.	Dement Neuropsychol	São Paulo, Brazil
4	2015	Investigation and diagnostic evaluation of a patient with dementia	Parmera, J. B., and Nitrini, R.	Rev Med	São Paulo, Brazil
5	2020	Factors associated with dementia in elderly	Santos, C.de S.doset al.	Ciências e Saúde Coletiva	Rio de Janeiro, Brazil
6	2020	Efficacy and safety of Ginkgo preparation in patients with vascular dementia	Wang, M.et al.	Ovid Technologies	China
7	2022	Benefits of treatment with Ginkgo Biloba extract EGb 761 alone or combined with acetylcholinesterase inhibitors	Garcia-Alberga, J. M.	Springer Science and Business Media LLC	Spain

Table 2. Papers on prevention of dementia

	Year	Title	Authors	Journal	Location
1	2017	Relevance of Omega-3 and Omega-6/Omega-3 ratio in the preventing cognitive impairment	Nunes, B.et al.	Revista Científica da Ordem dos Médicos	Porto, Portugal
2	2017	Diet and nutrition in the prevention and treatment of dementia	Cardoso, S. A., Paiva, I.	Acta Portuguesa de Nutrição	Porto, Portugal
3	2020	The problem of the epidemic of vascular dementia in Brazil: a bibliographic review	Gonçalves, L. F.et al.	Brazilian Journal of Health Review	Curitiba, Brazil
4	2015	Prevenção do declínio cognitivo [Preventionofcognitive decline]	Maciel, J. M. P.	PhD dissertation	Coimbra, Portugal
5	2016	Papel do exercício físico na prevenção do déficit cognitivo e da demência: o que sabemos sobre o tema? [The role of physical exercise in the prevention of cognitive deficit and dementia: What do we know about the subject?]	Amorim, A. F. C.	Master's thesis	Covilhã, Portugal

ParmeraandNitrini, 2015, p.182 They concluded the paper by showing that in order to define dementia, a cognitive decline that generates functional impairment in the individual is necessary. For the diagnosis, the involvement of two cognitive domains is required, which may or may not be memory. They point out that the current advancement of functional neuroimaging and biomarkers, new criteria will be adopted for the diagnosis of different dementias ParmeraandNitrini, 2015.

The study conducted by Santos, Bessa *et al*. 2020. aimed to analyze the factors associated with dementia in elderly people attended at a memory clinic at the *Universidade do Sul de Santa Catarina*UNISUL., through a cross-sectional study with analysis of data from medical records, from January 2013 to April 2016.The authors observed that until the moment of the development of the research, there was no Brazilian study with the focus of evaluating the factors associated with dementia in the elderly within the scope of a memory laboratory. They showed that, in Brazil, there are few studies that investigate dementia in the elderly population Santos, Bessa *et al*., 2020. Santos, Bessa *et al*.2020. concluded the research by noting that dementia has multifactorial causes, and the factors associated with dementia were lack of Vitamin D, depression, high blood pressure and an age of over 80 years. They also showed that dementia is a public health problem, with a great impact on health costs.In terms of treatment, studies show that there are few options for approved drugs and, in addition, they are not completely effective in the treatment of vascular dementia. Therefore, as an alternative to medication, researchers conducted a systematic review that evaluated the effectiveness of Ginkgo Biloba EGb 761 extract in the treatment of patients with vascular dementia. From this, it can be seen that there was an improvement in cognitive and behavioral levels, in addition to psychological symptoms García-Alberca*et al.*, 2022. According to the analysis of the components present in Ginkgo Biloba extract, it contains flavonoids, terpene lactones and several other constituents. Furthermore, when analyzing its functions, there is a positive effect on cognitive and neurological function, which occurs due to the improvement of vascular flow, the antioxidant effect, the anti-inflammatory action and the antiapoptotic action.

Consequently, there is an increase in neuroplasticity, there is modulation of amyloid aggregation and there is defense against mitochondrial dysfunction, thus conferring neuroprotective properties García-Alberca*et al.*, 2022. It is a fact that Ginkgo Biloba extract has been used for many years, as it has been considered a natural medicine since the 1980s, and since then it has been proven to improve cognitive function and daily activities in patients with vascular dementia who have mild cognitive impairment. In addition, it was also shown that, through clinical trials, this herbal medicine improves serum lipids, circulating lipoproteins and hemorrheological parameters Wang*et al.*, 2020. Therefore, among the alternatives for choosing the best treatment for patients diagnosed with vascular dementia, it was concluded that the Ginkgo Biloba extract is the most effective, as the drugs on the market have not been proved to be sufficient to improve cognitive function. However, donepezil, despite showing improvement in cognitive symptoms and functional abilities in patients with dementia, further studies are needed to assess the safety and efficacy of such a drug Brucki *et al.*, 2011. In addition, another 5 studies were selected, including 3 papers, a master's thesis and a PhD.dissertation, between 2015 and 2020, with the aim of understanding and deepening the theme of prevention of vascular dementia, since studies analyzed in the bibliographic survey on the causes, diagnosis and treatment of vascular dementia showed the importance of prevention.Table 2 shows the year, title, authors, journal, location and, in the sequence, a small description of the analyzed studies, where several possible aspects to prevent vascular dementia were explored. The first paper Nunes *et al.*, 2017. addressed early interventions through alimentation, namely Omega-3. The authors conducted an investigation to show that nutrients can provide good maintenance of cognitive function and, thus, prevent dementia.Nunes *et al.* 2017. showed that a Mediterranean-style diet can be a protective factor for cognitive function, which is characterized by consumption of fish, vegetables, fresh fruit, olive oil and nuts.Among the results achieved, on the one hand, they found that a low intake of Omega-3 n-3 PUFA. or a high intake of Omega-6 9n-6 PUFA. can accelerate cognitive decline between 10 and 80%. On the other hand, a higher consumption of n-3 PUFA or a lower consumption of n-6 PUFA may have beneficial effects, such as

stabilization of carotid and coronary atherosclerotic plaques Nunes*et al.*, 2017. The second paper studied Cardoso and Paiva, 2017. was based on the demand for nutrients, foods and beverages related to the development of vascular dementia. Cardoso and Paiva 2017. observed that in the group of antioxidants, vitamins E and C, selenium and flavonoids can be mentioned, which are very efficient in protecting against oxidative damage associated with dementia. They also showed that vitamin D, at low levels, was associated with cerebrovascular diseases and, consequently, with a greater risk of dementia and that Omega-3 fatty acids decrease serum cholesterol levels and systemic inflammation, in addition to inhibiting platelet aggregation, being, therefore, beneficial for the prevention of vascular dementia.In terms of beverages, the authors observed that there is a possible benefit from caffeine consumption, either through coffee or tea, providing a protective effect on dementia and cognitive decline Cardoso and Paiva, 2017. The paper showed that low to moderate intake of wine can be beneficial, while excessive alcohol consumption can increase the risk of dementia. As for dietary patterns, diets such as the Mediterranean type and MIND have been shown to be effective in protecting against dementia and in the progression of pre-dementia syndromes. On the other hand, the Western diet, which is composed of high consumption of saturated fatty acids, cholesterol and refined sugars, showed the opposite effects of both mentioned above, that is, it presented a higher risk of dementia and cognitive decline Cardoso and Paiva, 2017. The third paperGonçalves *et al.*, 2020. highlighted the risk factors for the development of vascular dementia, with metabolic and toxic factors being the most influential. Therefore, dyslipidemia, obesity, smoking and alcoholism are examples of these factors. In view of this, as they are possible conditions for modification, good nutrition, associated with healthy lifestyle habits, can prevent such risk factors and reduce cases of vascular dementia. Furthermore, this paper also showed that the disease in question is related to the population's level of education: individuals with low levels of education develop dementia in a greater number when compared to individuals with high levels of education, since this fact is closely linked to neuroplasticity Gonçalves *et al.*, 2020.

The authors showed that brain function is proportional to the connections between neurons and, the more there are, the less dementia symptoms the individual will present. Thus, neuroplasticity encompasses this definition and illustrates the relationship between education and cases of dementia. The authors found that in Brazil the population has an average of 4 years of study, proving the high proportion of vascular dementia in the country, when compared to others. Therefore, they concluded that low levels of education, associated with poor lifestyle habits, contribute to the increase in individuals with vascular dementia Gonçalves*et al.*, 2020. Maciel's 2015. PhD dissertation highlighted the six modifiable components that individuals in oldage can explore in order to prevent cognitive decline. The first component addressed was physical exercise, which proved to be more effective in men, since they practice more than women. Therefore, men present better cognitive performances, and those who practice aerobic exercises, such as running, walking and resistance training, presented even better results Maciel, 2015. The second component was cognitive training, which aims to enhance the individual's intellectual capacity and, therefore, exercise cognitive function, through, for example, the exploration of visual and auditory memories. The research presented a study carried out in the elderly of 83 years of age, with memory training, which were separated into an experimental group and a control group. At the end of the study, it was observed that there was an improvement in memory performance in the experimental group compared to the control group, thus proving that cognitive training brings positive results for the prevention of cognitive decline Maciel, 2015. The third component was food: the Mediterranean diet, whether associated with physical exercise or alone, is an effective method of prevention. This diet includes consumption of fish rich in Omega-3, nuts, fruit, cereals and little consumption of red meat, saturated fats and refined sugars. Studies have shown satisfactory effects in individuals who have adopted such a diet Maciel, 2015. The fourth component was the social context in which the individual was exposed throughout life to

the present day, encompassing education, profession, leisure and relationships. In the field of education, studies have shown that individuals with 15 years of education had a lower relative risk of developing dementia compared to those with less than 12 years Maciel, 2015. Studies have shown that high levels of education are beneficial for better development of cognitive function and that education acts both to prevent cognitive impairment from progressing and to delay symptoms of an already existing decline. However, for those who do not have a considerable level of education, leisure activities can be explored in order to stimulate the intellect and thus reduce cognitive decline, as shown in studies Maciel, 2015. In terms of leisure, activities can be divided into social, mental or physical, and they can positively or negatively influence cognitive function. In addition to cognitive improvement, leisure activities carried out together have emotional benefits, as they reduce stress and decrease anxiety levels. In the context of work, it can be concluded that elderly people submitted to a greater occupational complexity compared to those submitted to a low complexity, presented better cognitive function. Finally, in terms of relationships, it can be concluded, through a study, that people who lived without a partner during adulthood are about twice as likely to develop dementia in old age when compared to people who lived with a partner Maciel, 2015.

The fifth component was the emotional state, which has great power to influence cognitive function, since exacerbated exposure to anxiety, depression and stress compromises cognition. One study showed that adults with marked emotional instability are at greater risk of developing cognitive decline when compared to those with low emotional instability. Another study concluded that high levels of cortisol resulting from high exposure to anxiety, stress and depression can lead to dementia Maciel, 2015. Finally, the last component was the cardiovascular factor. Cardiovascular risk factors include: Type 2 Diabetes Mellitus, atherosclerosis, hyperlipidemia, arterial hypertension, hypercholesterolemia, cardiac and cerebrovascular pathology, increased body mass index and other pathological conditions. Among them, arterial hypertension stands out, since it causes cerebrovascular disease of small vessels, impairing neuronal tissue. Thus, uncontrolled arterial hypertension presents a greater risk of damaging brain tissue, leading to the development of vascular dementia Maciel, 2015. Amorim's 2016. Master's thesis investigated the relationship between physical exercise and cognitive function. Several studies have suggested benefits: in healthy elderly people, it has been observed that physical exercise is neuroprotective, as it reduces the risk of cognitive impairment and dementia after 5 years. In elderly people with dementia, programmed physical activity has been shown to delay cognitive decline, suggesting that it is an effective means of improving cognitive function in these patients. The research pointed out that physical activity is beneficial for the cognition of individuals, since it is involved with biological processes, namely: hippocampal neurogenesis, angiogenesis, increased expression of neurotrophic factors and neuroplasticity Amorim, 2016. Thus, the selected studies made it possible to understand the issue of the importance of preventing vascular dementia as a possibility of guaranteeing a healthy life and improving the quality of life for adults and the elderly,however, further studies show the need to also understand the issue of dementia in the current pandemic context, which will be addressed below.

The influence of COVID-19 in patients with vascular dementia: In fact, it is known that infection with the SARS-CoV-2 virus occurs due to its affinity for the angiotensin-converting enzyme 2, which is expressed in different organs, the main one being the lung, however, it can also reach the brain. Thus, as a public policy to try to contain viral dissemination and consequent contamination, social isolation was implemented, which brought not only benefits, but also harm to various population groups, including the elderly Silva*et al.*, 2021. Studies have shown that the virus in question preferentially affects individuals who have risk factors, among which vascular ones are more significant, such as diabetes, hypertension and cardiovascular disease. Therefore, due to the similarity of the risk factors for vascular dementia and for SARS-CoV-2, dementia is a risk factor for the coronavirus Silva*et al.*, 2021.

In addition, patients with dementia are not only susceptible to infection, but also present an additional risk, since the difficulty in memorizing hygiene recommendations and rules to avoid contagion contribute to putting these patients at risk Rodríguez*et al.*, 2021. Furthermore, due to the imposed measure of social isolation, physical exercise, social activities, cognitive and behavioral therapies were impaired, which are preventive alternatives for patients with dementia Mazuchelli *et al.*, 2021. In addition, isolation also reduced the number of consultations, compromising the performance of neurological examinations. Therefore, such losses aggravated the condition of these individuals, since they have increased chances of developing anxiety and depression, in addition to sleep disorders and behavioral changes. It is worth noting that the caregivers of these patients were also affected, as the work overload and stress increased Rodríguez *et al.,* 2021. Finally, studies have shown that patients with dementia and affected by COVID-19 have a higher lethality rate when compared to other patients of a similar age group and with similar comorbidities. Among the influential factors, cardiovascular and respiratory risks are most considerable. The study showed that SARS-CoV-2 has neuroinvasive potential, which may affect the progression and/or precipitation of neuropathological changes, which can lead to a neurodegenerative disease Reyes-Bueno*et al.*, 2020.

CONCLUSION

The present study addressed vascular dementia in a broad way, since it elucidated causes, diagnosis and treatment, in order to clarify the picture of this pathology. Therefore, among the main causes are those related to stroke, both ischemic and hemorrhagic, to thrombus injury and type 2 diabetes mellitus. The research was extremely relevant, as the condition of dementia mainly affects the elderly, requiring extensive care aimed at this public. Thus, in addition to the 3 main causes, there are associated factors that contribute to the development of this disease, namely lack of vitamin D, depression and high blood pressure.With that, family members, caregivers and health professionals should be aware of the first signs and the care that patients need, since there must be a broad and multidisciplinary treatment. It can be proved that there are modifiable factors in old age: physical exercise, cognitive training, alimentation, social context, emotional state and cardiovascular factors. Once the dementia medical condition is installed, the individual will show symptoms of cognitive decline, mainly, memory loss being the most common. The diagnosis is based on clinical examination, cognitive and neuropsychological tests, as well as neuroimaging and laboratory tests.Finally, there are not sufficiently proven drug options for the treatment, requiring alternative therapies to support the patient. It was proven that the use of Ginko Biloba extract brought improvement in cognitive, behavioral and psychological levels. Furthermore, the present study showed the relationship of vascular dementia as a risk factor in the context of the COVID-19 pandemic, which fully affected the health of the elderly.

REFERENCES

Amorim, A. F. C. 2016. Papel do exercício físico na prevenção do défice cognitivo e da demência: o que sabemos sobre o tema?. Master's Thesis in Health Sciences.University of Beira Interior, Covilhão, Portugal.

Araújo, C. L. de O, and Nicoli, J. S. 2010. Uma revisão bibliográfica das principais demências que acometem a população brasileira. In Revista Kairós Gerontologia.131. , pp. 231-44.

Brucki, S. M. D., Ferraz, A. C., Freitas, G. R. de, Massaro, A. R., Radanovic, M., and Schultz, R. R. 2011. Treatment of vascular dementia. DementNeuropsychol. 45. , pp. 275-287.

Brum, A. K. R., Camacho, A. C. L. F., Valente, G. S. C., Sá, S. P. C., Lindolpho, M. da C., and Louredo, D. dos S. 2013. Programa para cuidadores de idosos com demência: relato de experiência. Revista Brasileira de Enfermagem. 664. , pp. 619-624.

Cardoso, S. A.,and Paiva, I. 2017. Nutrição e alimentação na prevenção e terapêutica da demência.Associação Portuguesa de Nutrição.511. , pp. 30-34.

Denzin K. N., and Lincoln Y. S. 2006. O planejamento da pesquisa qualitativa: teorias e abordagens, Artmed,Porto Alegre, Brazil.

Engelhardt, E., Tocque, C., André, C., Moreira, D. M., Okamoto, I. H., and Cavalcanti, J. L. de S. 2011. Demência vascular. Critérios diagnósticos e exames complementares. Dementia & Neuropsychologia. 51. , pp. 49-77.

Fornari, L.H.T., Garcia, L. P., Hilbig, A., and Fernandez, L. L. 2010. As diversas faces da síndrome demencial:como diagnosticar clinicamente?.Scientia Medica.202. , pp. 185-193.

Furtado, M. T. S., Almeida, E. B. de,and Silva, T. B. L. da 2021. Reabilitação cognitiva na pessoa idosa diagnosticada com demência vascular: um estudo de intervenção da terapia ocupacional. RevistaKairós: Gerontologia. 2429. , pp. 359-373.

García-Alberca, J. M., Mendoza, S., and Gris, E.2022. Benefits of Treatment with Ginkgo Biloba Extract EGb 761 Alone or Combined with Acetylcholinesterase Inhibitors in Vascular Dementia. Clinical Drug Investigation.Springer Science and Business Media LLC. 425. , pp. 391-402.

Gil,A. C. 1999. Métodos e técnicas de pesquisa social, Atlas, São Paulo, Brazil.

Gonçalves, L. F., Oliveira, J. de S.,Guimarães, A. C. R. C., Guimarães, B. E. da S. M., Soares, C. E. M., Gomes, H. S., and Queiroz, T. C. C. de 2020. A problemática da epidemia de demência vascular no Brasil: uma revisão bibliográfica. BrazilianJournalOf Health Review.35. , pp. 15451-15459.

Henriques, B. M. P. 2013. O efeito de um programa psicomotor para idosos com demência – importância da psicomotricidade como terapia coadjuvante junto da fisioterapia. PhDdissertationin Physiotherapy.Fernando PessoaUniversity, Porto, Portugal.

Ionel, C. 2015. Acidente vascular cerebral e demência vascular no idoso.Master's Thesis in Medicine.CoimbraUniversity, Coimbra, Portugal.

Jesus, V. M. de 2016. Demência: Uma Visão Multidisciplinar do Papel do Psicólogo. Master's Thesis in Psychology. Universidade Católica Portuguesa, Porto, Portugal.

Lakatos, E. M.,and Marconi, M. de A. 2003. Fundamentos de metodologia científica, Atlas, São Paulo, Brazil.

Lopes, V. M., Fernandes, B. K. C., Leite, S., and Borges, C. 2020. Diagnósticos de enfermagem de um idoso institucionalizado com Demência Vascular. Enfermagem: a ciência da vida. 14. , pp. 38-43, 2020.

Maciel, J. M. P. 2015. Prevenção do declínio cognitivo.PhD Dissertation. Coimbra University, Coimbra, Portugal.

Mazuchelli, L. P., Soares, M. F. de P., Noronha, D. O., and Oliveira, M. V. B.2021. Discursos sobre os idosos, desigualdade social e os efeitos das medidas de distanciamento social em tempos de Covid-19. Saude Soc.303. , pp. 1-12.

Medrano, M., Castro-Tejada, G., Lantigua, R., Silvestre, G., Diaz, S., Mota, P., and Diaz-Garelli, F. 2021. Vascular mild cognitive impairment and its relationship to hemoglobin A1c levels and apolipoprotein E genotypes in the Dominican Republic. Dementia & Neuropsychologia.151. ,pp. 69-78.

Nunes, A. L. da S. de S. 2015. O papel da aterosclerose na demência. Master's Thesis in Medicine.CoimbraUniversity, Coimbra, Portugal.

Nunes, B., Pinho, C., Sousa, C., Melo, A. R., Bandarra, N., and Silva, M. C.2017. Relevância dos Índices Ómega-3 e Razão Ómega-6/Ómega-3 na Prevenção do Défice Cognitivo. Revista Científica da Ordem dos Médicos. 303. , pp. 213-223.

Parmera, J. B.,and Nitrini, R. 2015. Demências: da investigação ao diagnóstico. Rev Med. 943. , pp. 179-184.

Raymundo, T. M., Boligon, B., Canales, E. B., Nascimento, M. X. C., and Bernardo, L. D.2017. Treino cognitivo para idosos: uma estratégia interventiva utilizada pela Terapia Ocupacional. Revista Ocupación Humana. 172. , pp. 5-19.

Reyes-Bueno, J. A., Mena-Vázquez, N., Ojea-Ortega, T., Gonzalez-Sotomayor, M. M., Cabezudo-Garcia, P., Ciano-Petersen, N. L., Pons-Pons, G., Castro-Sánchez, M. V., and Serrano-Castro, P.

J.2020. Análisis de letalidad por COVID-19 en pacientes con demencia neurodegenerativa. Neurología. 359. , pp. 639-645.

Rodrigues, R. C. B., Corrêa, M. I., Santos, A. P. O., Lima, C. S. de A., Prado, G. R., Miranda, L. T., Barreto, M. B. L., Silva, M. S., Pereira, R. da S., and Aredes, R. F. de2020. A importância dos cuidados paliativos no serviço de assistência domiciliar para os pacientes com doenças demenciais avançadas. Revista Eletrônica Acervo Científico. 151. , pp. 1-6.

Rodríguez, J. de J. L., Gutierrez-Herrera, R., and Zayas-Llerrena, T. 2021. Cuidados de las personas con demencia durante la Covid-19. Anales de La Academia de Ciencias de Cuba.111. , pp. 1-6.

Santos, C. de S. dos, Bessa, T. A. de, and Xavier, A. J. 2020. Factorsassociatedwithdementia in elderly. Ciência & Saúde Coletiva. 252. , pp. 603-611.

Santos, M. A. O., Bezerra, L. S., Correia, C. da C., and Bruscky, I. S.2018. Neuropsychiatric symptoms in vascular dementia: epidemiologic and clinical aspects. Dementia & Neuropsychologia. 121. , pp. 40-44.

Severiano, D. L. dos R. 2019. Avaliação da dinâmica lipídica no modelo de Demência Vascular. PhD Thesis in Pharmaceutics.Federal University of Goiás, Goiânia, Brazil.

Silva, C. C. da, Carvalho, C. M. O. de, Lima, D. C. de, Costa, E. S., Andrade, V. M. B. de, Tenorio, B. M., Britto, D. B. L. de A., and Tenorio, F. C. A. M.2021. Covid-19: Aspectos da origem, fisiopatologia, imunologia e tratamento: uma revisão narrativa. Revista Eletrônica Acervo Saúde. 133. , pp. 1-8.

Souza, R. K. M. de, Barboza, A. F., Gasperin, G., Garcia, H. D. B. P., Barcellos, P. M., and Nisihara, R. 2020. Prevalência de demência em pacientes atendidos em um hospital privado no sul do Brasil. Einstein.18, pp. 1-7.

Teldeschi, A. L. G., Perez, M., Sanchez, M. A., and Lourenço, R. A.2018. O uso de testes de fluência verbal como ferramenta de rastreio cognitivo em idosos. Revista Hospital Universitário Pedro Ernesto. 161. , pp. 56-60.

Wang, M., Peng, H., Peng, Z., Huang, K., Li, T., Li, L., Wu, X., Shi, H.2020. Efficacy and safety of ginkgo preparation in patients with vascular dementia. Medicine. 9937. , pp. 22209-22215.

****