

PARTICULARITIES OF ORAL HEALTH PROBLEMS IN PATIENTS WITH ALZHEIMER'S DEMENTIA

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PARTICULARITIES OF ORAL HEALTH PROBLEMS IN PATIENTS WITH ALZHEIMER'S DEMENTIA (Abstract) **Aim:** Dementia and especially Alzheimer's dementia represent one of the most important disorder of this century with a lot of negative consequences for the patient himself, but also for family and community. The essential features of dementia are represented by multiple cognitive deficits, at least one of the following: aphasia, apraxia, agnosia, or a disturbance in executive, which diminished the quality of life of these patients. Unfortunately, in majority of the cases, the oral health care of these patients does not represent a priority. The aim of our study is to establish a series of general coordinates on the pattern of development of oral diseases in patients with dementia. **Material and methods:** We focused on the clinical evolution of 50 patients from “Socola” Institute of Psychiatry Iasi, with the diagnosis of Alzheimer's dementia, according to ICD 10 criteria, from the point of view of the general and dental status, the prognosis and the therapeutic possibilities. **Results:** Our results reveal that 78% of patients with moderate dementia had partial and total edentation and 56% of patients with severe dementia had partial edentation, while 21% total edentation. **Conclusions:** Thus, in this context, increasing the quality of life of these patients means to improve the general condition of the elderly, which is closely related to the maintenance of natural teeth and the development of well-adapted prostheses. **Keywords:** ORAL HEALTH, DEMENTIA, QUALITY OF LIFE.

Dementia is a progressive and irreversible neurodegenerative disorder characterized by a variety of symptoms: cognitive impairment, memory disorders, progressive deterioration of daily exercise capacity, and a range of neuropsychiatric symptoms. According to the World Alzheimer Report from 2015, regarding "The Global Impact of Dementia", the number of people diag-

nosed with dementia will increase from 46 million, in the present, to 131,500,000 by 2050 (1). Statistical data show that about 9.9 million new cases of dementia will be diagnosed this year around the world. Thus, a new case is diagnosed every three seconds. According to the report, about 94% of people living with dementia in low-income and middle-income countries are

home-grown. In many of these countries there is no developed nursing and specialized care network for people with dementia (1, 2).

The world population is experiencing an aging process, the number of people over 60's years old suffered an increase of 450 million in only 40 years. The structure of the elderly population has changed to more than 50% in developed countries, the most aging being from the European area. Dementia caused by Alzheimer's disease is the most common type, representing approximately 60% of all dementia patients. As for the link between age and illness, it is estimated that 5% of persons of 65 years old have dementia in Alzheimer's disease, and at the age of 85, the rate goes up to 25%(1, 3, 4, 5).

Oral health problems may adversely affect the quality of life of patients with Alzheimer's dementia. However, as the patient suffering from Alzheimer's dementia requires a wide range of care, often oral health care is not a priority. Increasing the quality of life and improving the general condition of the elderly is closely related to the maintenance of natural teeth and the development of well-adapted prostheses (6, 7, 8). Given that cognitive functions and motor skills are progressively altered in patients with Alzheimer's dementia, this circumstance can lead to a level inadequate control of biofilm and oral hygiene. Alzheimer's dementia is a complex pathology that, beyond the loss of cognitive function, leads to alteration of the ability to perform common daily activities (7, 9, 10).

The spectrum of adverse effects attributed to the medication used to control the symptomatology specific to dementia also reaches the oral sphere, emphasizing the issues already exposed. On the one

hand, anti-dementia medication (anti-acetylcholinesterase) causes hypersalivation, which makes it more difficult to maintain a dry field during dental treatment and causes difficulties in maintaining a mobilizable prosthesis (10, 11, 12, 13). On the other hand, xerostomia is a common side effect associated with adjuvant medication used in dementia, such as antidepressants and benzodiazepines. Insufficient salivation reduces the lubrication of mucosal tissues, increasing the potential for mucosal ulceration, and increasing the difficulty of maintaining a mobilizable prosthesis. At the same time, xerostomia leads to alteration of normal oral flora, causing gingival plaque formation, predisposing to periodontal disease, dental caries and increased risk of infection (14, 15, 16).

MATERIAL AND METHODS

The study included 50 patients admitted to acute department III, V and VII in "Socola" Psychiatry Institute Iasi, during the year 2017. The study group consists of roughly equal numbers of males and females with a slight superiority of female gender (56% female and 44% male). Clinical and anamnestic data were extracted from the observation sheets of these patients. The dental evaluation was conducted within the dental office of the Institute. The criteria for inclusion in the study were: confirmed diagnosis of Alzheimer's dementia, both with early onset and with late onset and edentation.

Alzheimer's dementia diagnosis is established according to ICD 10 criteria (17). Dementia in Alzheimer's disease with early onset: The criteria for dementia in Alzheimer's disease must be met, and the age at onset being under 65 years; In addition, at least one of the following requirements

must be met: (a) evidence of a relatively rapid onset and progression; (b) in addition to memory impairment, there is aphasia (amnesic or sensory), agraphia, alexia, acalculia, or apraxia (indicating the presence of temporal, parietal and/or frontal lobe involvement).

Dementia in Alzheimer's disease with late onset: The criteria for dementia in Alzheimer's disease must be met and the age at onset must be 65 or more. In addition, at least one of the following requirements must be met: (a) evidence of a very slow, gradual onset and progression (the rate of the latter may be known only retrospectively after a course of three years or more); (b) predominance of memory impairment over intellectual impairment (see general criteria for dementia).

Once the patient is diagnosed, the progression of the disease is clinically and anamnестically assessed, also with the help of the Mini Mental State Examination, a nonspecific instrument that has no diagnostic but merely indicative role. At the same time, scores on the Hamilton Depression Rating Scale of patients with Alzheimer's dementia showing negative hypertimic symptoms are also recorded.

In terms of edentation, patients were in one of the following classes: partial edentation, when at least three consecutive teeth in the lateral area or four front teeth are missing; subtotal edentation, when the arcade remains at most three teeth; total edentation, lack of all teeth.

Oral Health Indicators used in this study are the OHI index and the CAO-D index, both of which are internationally recognized by dental scientific organizations. The OHI is the sum of the soft deposit index and the tartar index.

The soft deposit index: 0-absence of soft

deposits; 1-soft deposits covering up to 1/3 of the surface of the teeth; 2-soft deposits covering 1/3-2/3 of the surface of the teeth; 3-soft deposits covering more than 2/3 of the surface of the teeth.

Tartar index: 0-the absence of tartar; 1-supragingival tartar covering not more than one-third of the surface of the tooth; 2-supragingival tartar that covers between 1/3 and 2/3 of the exposed tooth surface; 3-surgingival tartar covering more than 2/3 of the tooth surface.

RESULTS

The results obtained by correlating the degree of dental affection with the degree of psycho-cognitive impairment and the presence of depression symptoms, apathy and serious difficulty in targeting, indicate the existence of a direct relationship between these variables. Thus, most patients with dementia have associated oral pathology, the most significant, with an increased impact on the patient's outstanding function being the edentation of different degrees. It is noticeable that in most cases we face subtotal edentation, followed by the total edentation, present in a significant percentage.

Distribution of cases by age reveals a predisposition for the eighth decade. It should be noted that patients are not newly diagnosed cases and clinical and anamnestic information in the observation sheets reveals that most of them were originally dementia Alzheimer type, with early onset (tab. I, fig. 1).

Patients with dementia develop depressive symptoms of varying degrees of intensity, the group of those with overweight depressed mood associated with 92% of total and subtotal edentation (fig. 2).

The distribution of the CAO-D index in patients in the study group is the following:

number of caries-1,12 teeth; number of absent teeth - 4.48; number of teeth closed - 0.32. Regarding the oral hygiene index, 84% of the patients obtained a weak index, 14% moderate and only 2% of the patients a good hygiene index.

TABLE I
The distribution of cases by age and sex

Age	Male		Female		Total	
	Number of patients	%	Number of patients	%	Number of patients	%
50-59	1	2	2	4	3	6
60-69	4	8	6	12	10	20
70-79	11	22	15	30	26	52
80-89	6	12	5	10	11	22
Total	22	44	28	56	50	100

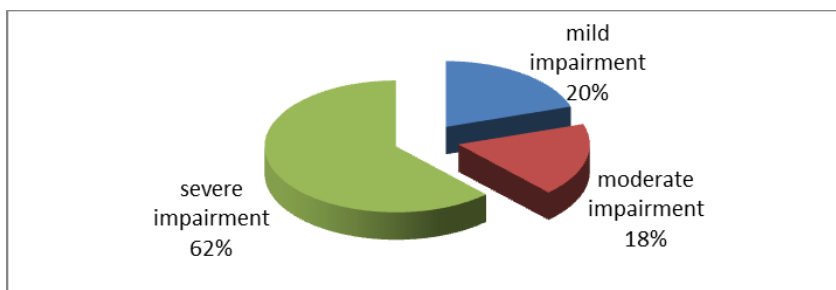


Fig. 1. Degree of cognitive impairment

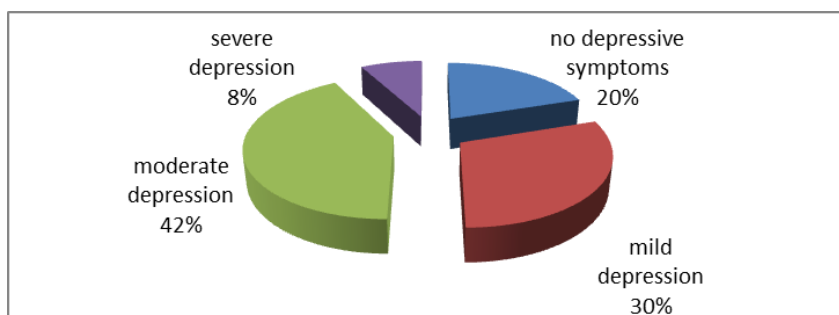


Fig. 2. Depressive symptoms in patients with Alzheimer's disease

Of all patients included in the present research, it is noted that there are none that do not show a degree of edentation (fig. 3).

In addition, 78% of patients with mod-

erate dementia had partial and total edentation and 56% of patients with severe dementia had partial edentation and 21% had total edentation.

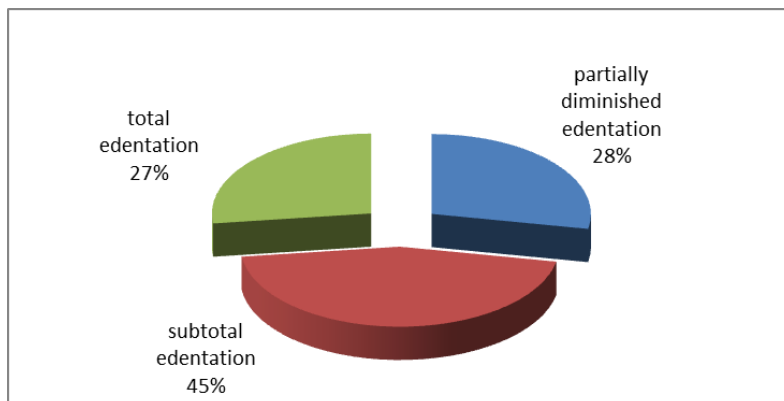


Fig. 3. Edentation in patients with Alzheimer`s disease

DISCUSSION

In 2014, the General Assembly of the World Federation of Public Health Associations issued a resolution on the importance of oral health of patients with dementia (18, 19). The prevalence of dementia is growing globally. Patients with dementia gradually install serious communication difficulties with those responsible for their care. Recent studies show that the precarious oral condition of people with dementia is directly correlated with socio-economic status, but also with demographic variables (20). Thus, the results of this research are linked to the results obtained in the literature, emphasizing the direct relationship of a precarious socio-economic status and a greater severity of the pathology in the oral sphere in the patients diagnosed with dementia (21).

In addition, as the present research shows, patients with dementia receive psychotropic treatment, especially for controlling behavioral and psychotic symptoms, but also for controlling depressive symptoms that can cause xerostomia and dry mouth syndrome, favoring candida infections, but also the appearance of dental caries and, on the other hand, sialorrhea. In

addition to this, patients with dementia either forget or lose their ability to ensure daily oral hygiene. Thus, the persons responsible for these patients (family members or medical staff) must ensure this process (22).

Depending on the evolutionary state of dementia, oral health becomes a growing problem, being totally dependent on the care of others. Multiple studies have directly correlated the degree of cognitive impairment with the precariousness of oral health (23). In the same vein, the present research shows that most cases of severe edentation (subtotal and even total) occur in patients with moderate to severe dementia, who are, moreover, frequently hospitalized in psychiatric or institutionalized services.

A study conducted in Sweden between the years 2007 and 2015 (24) shows that as dementia progresses, addressability for dental services decreases significantly. At the same time, the MMSE score has been shown to be a remarkable predictor of edentation, in the context of increasingly poor dental hygiene and the appearance and evolution of dental caries. These elements are also found in the results of this research. In addition,

the same study is the first longitudinal research that examines oral health in premorbid stages and after diagnosis of dementia. Unlike our study, it reports the results to the population with cognitive impairment before dementia. This study only indicates the prevalence of oral pathology among patients with already diagnosed dementia and especially among those with moderate-severe dementia (24, 25).

In 2017, a study realized by Campos et al. (26) shows that the masticatory efficacy in Alzheimer's dementia remains below the control level, as indicated by our study, which highlights the severity of the masticatory and swallowing disorders in direct proportion to the evolutionary stage of dementia.

Cognitive decline, apathy and apraxia, symptoms that characterize the average progression of dementia are responsible for the lack of interest and inability to perform oral hygiene techniques (24). In advanced stages, Alzheimer's disease leads to total disability, augmented by the associated general health problems and by the diverse oral pathology resulting in even greater dysfunctionality. Loss of teeth reduces masticatory capacity, increasing the risk for

serious swallowing and denaturing disorders (25).

The results of this research relate to the results of international general statistics, revealing a remarkable share of depressive symptoms in dementia, which correlates with specific progressive deterioration, aggravates apato-abulic phenomena, as well as apraxia itself, that correlates directly with the appearance and evolution of oral pathology, reaching to the edentation.

CONCLUSIONS

This study could be the premise of a program designed to increase the quality of life of patients with dementia, including oral health care among all the other fundamental problem of these patients. The results of our study show once more that beyond the psychiatric symptomatology, the patient with dementia associates a series of general health problems that hinder the evolution of the underlying disease. Through the correct, multidimensional approach of the patient with dementia, by managing all psychiatric symptoms such as depression, general health problems, including oral pathology and the risk of edentation, can be avoided or alleviated.

REFERENCES

1. ***The World Alzheimer Report. *The Global Impact of Dementia: An analysis of prevalence, incidence, cost and trends* 2015. <https://www.alz.co.uk/research/world-report-2015>.
2. Szalontay A, Burtea V, Ifteni P. Predictors of Institutionalization in Dementia. *Rev Cercet Interv Socială* 2015; 49: 249-256.
3. Crețu OC, Szalontay AS, Mircea R, Chiriță V, Chiriță R. Ethical-normative conceptual evaluation in assisting people affected by Alzheimer disease. *Rev Rom Bioetică* 2010; 8(2): 134-140.
4. Knopman DS et al. Practice parameter: Diagnosis of dementia (an evidence-based review). *Neurology* 2001; 56(9): 1143-1153.
5. Ungureanu E, Nechita P, Frîncu RM., Szalontay AS. Dementia-ethical and legal implications in psychiatric medical assistance. Case report. *Rev Med Chir Soc Med Nat Iasi* 2017; 121(1): 83 - 88.
6. McDowell I. Alzheimer's disease: insights from epidemiology. *Aging* 2001; 13(3): 143-162.

7. ***American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders 5th Edition*. American Psychiatric Publishing, Inc: Washington, DC, 2013.
8. Crețu O., Szalontay AS., Chiriță R., Chiriță V. Effects of memantine treatment on patients with moderate severe Alzheimer disease treated with donepezil. *Rev Med Chir Soc Med Nat Iasi* 2008; 112(3): 641-645.
9. Pasinetti GM. From epidemiology to therapeutic trials with anti-inflammatory drugs in Alzheimer's disease: the role of NSAIDs and cyclooxygenase in beta-amyloidosis and clinical dementia. *J Alzheimers Dis* 2002; 4(5): 435-445.
10. Szalontay AS, Dima-Cozma C, Chele G, Crețu O, Chiriță R, Jordanova V. Diabetes and obesity - risk factors for dementia? *Bul Psih Integrativă* 2012; 18(2): 58-66.
11. Călin AM, Debita M, Dragomir R, Ștefănescu OM, Budacu C, Szalontay AS. Treatment methods conditioned by the gravity of drug- induced gingival hyperplasia. *Rev Chimie* 2017; 68(11): 2618-2622.
12. Cerutti-Kopplin D *et al*. Tooth Loss Increases the Risk of Diminished Cognitive Function: A Systematic Review and Meta-analysis. *JDR Clin Translational Res* 2016; 1(1): 10-19.
13. Beldiman MA, Tatarciuc MS, Bosânceanu DN, Macovei G, Luchian I, Mârțu I. Quality of life and psychological and social aspects for elderly patients-the oral health impact profile questionnaire. *J Oral Rehabilitation* 2017; 9(1): 39-46.
14. Ide M, Harris M, Stevens A, Sussams R, Hopkins V, Culliford D. *et al*. Periodontitis and Cognitive Decline in Alzheimer's Disease. *PLoS ONE* 2016; 11(3): e0151081.
15. Naorungroj S. *et al*. Tooth loss, periodontal disease, and cognitive decline in the Atherosclerosis Risk in Communities (ARIC) study. *Community Dent Oral Epidemiol* 2015; 43(1): 47-57.
16. Takeuchi K. *et al*. Tooth Loss and Risk of Dementia in the Community: the Hisayama Study. *JAGS* 2017; 65(5): 95-100.
17. ***World Health Organization. International Statistical Classification of Diseases and Related Health Problems (ICD) 10th revision. 1992.
18. Harding A, Robinson S, Crean J, Singhrao SK. Can Better Management of Periodontal Disease Delay the Onset and Progression of Alzheimer's Disease? *J Alzheimer's Dis* 2017; 58(2): 337-348.
19. Călin AM., Debita M., Ciurcaru OE., Scutariu MM., Szalontay AS. Xerostomia and Hyposalivation in Patients with Physical and Psychopathological Disabilities. *Rev Chimie* 2017; 68(10): 2443-2447.
20. Dima-Cozma C., Mitu F., Szalontay A., Cojocaru DC. Socioeconomic Status and Psychological Factors in Patients with Essential Hypertension. *Rev Cercet Interv Socială* 2014; 44: 147-159.
21. Okamotoa N. *et al*. Association between Tooth Loss and the Development of Mild Memory Impairment in the Elderly: The Fujiwara-kyo Study. *J Alzheimer's Disease* 2015; 44: 777-786.
22. Scutariu MM, Surdu A, Macovei G. Methods of integrating aesthetic rehabilitation into the treatment plan of elderly patients. *Rev med Chir Soc Med Nat Iasi* 2015; 119(2): 557-563.
23. Popovac A, Stancic I, Despotovic N, Nikolic N, Stefanova E, Milasin J. Differnec in apolipoprotein E genotype distribution between dentate and edentulous elderly patients with Alzheimer disease. *Genetika* 2016; 48(2): 699-706.
24. Fereshtehnejad S.M. *et al*. Dental care utilization in patients with different types of dementia: A longitudinal nationwide study of 58,037 individuals. *Alzheimer and dementia* 2018; 14(1): 10-19.
25. Ghezzi E., Ship J. Dementia and oral health. *Oral Surg Oral Med Oral Pathol Oral Radiol* 2000; 89: 2-5.
26. Campos C.H. *et al*. Mastication and oral health-related quality of life in removable denture wearers with Alzheimer disease. *J Prosthet Dent* 2017; 118(3): 251-262.