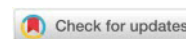


PERIODONTAL STATUS OF INSTITUTIONALIZED ELDERLY

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Abstract: Impaired general health in institutionalized elderly has an impact on oral health and dental status, especially on periodontal health and oral hygiene. The periodontal health of institutionalized elderly people is influenced by a number of other factors such as: multimorbidity, dependence in maintaining oral hygiene, limited abilities and mobility and the use of numerous medications. Progression of periodontal disease is characterized by the presence of increased destruction of periodontal tissues. The destruction of periodontal tissues is seen through the presence and increased clinical loss of the attachment, but also through the presence of gingival recession and resorption of the alveolar bone. The most common form of periodontal disease in older adults is chronic periodontitis. Due to the chronicity of this disease, most of the detected periodontal disorders are due to the accumulation of the disease over time. The interaction of the highly prevalent xerostomia and the inability to maintain oral hygiene at a satisfactory level in institutionalized elderly leads to an increased incidence of dental plaque. Due to that, the elderly have an increased risk of manifesting dental caries and periodontal diseases. Taking into account the aforementioned facts about oral health, the presence of numerous dental and oral problems, as well as the increased health needs and impaired health in institutionalized elderly people, the aim of this paper was to assess periodontal health among institutionalized elderly people over 65 years of age. Assessment of periodontal status among institutionalized elderly was done by using the Ramfjord Periodontal Disease Index. The research was conducted in the period from April to July 2018 in the Department "Mother Teresa", part from the Gerontological Institute "Thirteenth November" - Skopje. It included a total number of 75 people over the age of 65 who were accommodated in the department and gave their consent to participate in the research. The dental clinical examination was performed in the long-term care institution, in the office or in the rooms of the institutionalized elderly or in a room determined for that purpose. The examination of the subjects was performed on a patient sitting on a chair, lying in bed or placed in a wheelchair. For the examination a dental probe, a dental mirror and disposable gloves and a portable lamp for artificial illumination were used. The average number of present (remaining) teeth in the respondents was 5.81 ± 7.34 (range 0-24, with Confidence interval from 4.09 to 5.52). The mean value of the simplified OHI Green Vermilion index obtained for the presence of dental plaque was 2.33 ± 0.51 (range from 1.33 to 3.00, with Confidence interval from 2.15 to 2.51). The average value for the Ramfjord index (for assessment of periodontal health) was 4.57 ± 0.74 (range 2.5 to 6.00, with Confidence interval 4.33 to 4.82). Most of the subjects after the appropriate analysis had moderately advanced periodontitis (68.42% of the subjects). Based on the obtained data and subsequent analysis of the results we had found high percentage of people with unsatisfactory oral hygiene and high prevalence of periodontal disease.

Keywords: periodontal status, institutionalized elderly, long-term care patients, oral hygiene.

INTRODUCTION

Among institutionalized elderly there is a high prevalence of comorbidities and barriers for achieving adequate health care. Impaired general health in these people has an impact on oral health and dental status, especially on periodontal health and oral hygiene. The periodontal health of institutionalized elderly people is influenced by a number of other factors such as: multimorbidity, dependence on maintaining oral hygiene, limited abilities and mobility and the use of numerous medications.

Periodontal health is among the not-worrying problems within the so-called long-term care, for which with minimal interventions the maximum benefit can be achieved in terms of quality of life, psychological well-being and of course life satisfaction in adults. (Thorne et al, 2001)

Oral health care has an even greater and more significant role in institutionalized older people because there is an association of dental status with mortality and morbidity in the elderly population. Holmlund et al. (2010) concluded that tooth loss may indicate an increased risk for developing serious general diseases.

According to Alian et al. (2006), the high prevalence of coronary dental caries and root caries is seen in the elderly population worldwide and advanced dental caries and periodontal disease are considered to be the most important causes of tooth extraction.

With age, the thickness of tooth cement increases, and this phenomenon is based on the successive deposition of new layers of dental cementum. (Bosshardt & Selvig, 1997)

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Progression of periodontal disease is characterized by the presence of increased destruction of periodontal tissues. The destruction of periodontal tissues is seen through the presence and increased clinical loss of the attachment, but also through the presence of gingival recession and resorption of the alveolar bone. Periodontal disease is not considered to be an inevitable consequence of aging, but aging itself is thought to increase the sensitivity of periodontal tissues. (Lindhe et al, 2004) The progression of periodontal tissue diseases can be influenced by some other factors such as trauma, systemic diseases, drug use, as well as reduced oral hygiene and the hygiene of prosthetic devices.

According to Stavrevska-Minovska et al.(2004), the general health condition of the elderly has significant influence reflecting on the health of periodontal tissues. They also noticed that among the elderly a healthy periodontium can be found (extremely rare), but most often persons with periodontal infection or elderly with a treated periodontium are present.

Periodontal changes become more evident over the years. According to Lindhe et al. (2004) there is an increased presence and increased gingival recession with increasing age. According to Lamevski and Ivanovski(2011) there is a high and statistically significant positive correlation between the degree of alveolar bone resorption and the age of the subjects.

The most common form of periodontal disease in older adults is chronic periodontitis. Due to the chronicity of this disease, most of the detected periodontal disorders are due to the accumulation of the disease over time. Saliva is a key element in oral homeostasis, oral function, and oral health. Hyposalivation is a risk factor not only for dental caries and periodontal disease, but also for taste disturbances, speech problems, swallowing problems, poor chewing ability and malnutrition. According to Samnieng et al.,(2012) patients with hyposalivation have a higher number of carious teeth and a higher prevalence and progression of periodontitis than those with normal salivation. But hyposalivation is also associated with other factors such as gender, systemic diseases, drug use and smoking. More than 400 drugs cause xerostomia, as a side effect of their use. Gupta et al. (2006) and Liu et al. (2012) in their research found that more than 80 percent of commonly prescribed drugs can cause xerostomia. Some of them are the following groups of drugs: analgesics, antipsychotics, antihypertensives, anticholinergics, antihistamines, diuretics, narcotics, cytostatics and others. According to a study by Ursache et al., (2006) the prevalence of xerostomia is 60 percent of older institutionalized individuals, both sexes equally. The interaction of the highly prevalent xerostomia and the inability to maintain oral hygiene at a satisfactory level in institutionalized elderly leads to an increased incidence of dental plaque. Due to that, the elderly have an increased risk of manifesting dental caries and periodontal diseases.

Taking into account the aforementioned facts about oral health, the presence of numerous dental and oral problems, as well as the increased health needs and impaired health in institutionalized elderly people, the aim of this paper was to assess periodontal health among institutionalized elderly people over 65 years of age.

MATERIAL AND METHODS

Assessment of periodontal status among institutionalized elderly was done by using the Ramfjord Periodontal Disease Index. Six representative teeth (16,21,24,36,41,44) are used to determine the index. The large number of lost teeth in the examined population led to the inability to apply this index consistently. If it was noticed that one of the representative teeth is missing, it was replaced. So, if one of the premolars or molars were missing, it was replaced with the first tooth located more distally than the representative tooth, if one of the representative incisors was missing, then it was replaced first with one of the contralateral central incisions, then, if it was missing, it was taken the value for the adjacent lateral incision, and if it was missing, the value for the opposite lateral incision was taken. In case of lack of some of the replacement teeth (absence of all incisions or absence of teeth distally from the second molar) then that tooth was not replaced, and the index is obtained as the average value of the examined sides of the remaining teeth present.

Only the gingival and periodontal component of this index was used to fulfill the objectives of this paper. During our examination, the gingival status was first determined. Depending on the criteria, the condition was assessed with numerological values from 1 to 3. When examining the condition of the gingiva, the following criteria were taken : color, position, consistency and the presence of exudate on the gingiva. Thus, if the changes were small and occupy certain parts of only one area of the tooth, then the value 1 according to the proposed values of the index was noted. If the changes were localized on more than one surface, but do not occupy the surface of the gingiva around the entire tooth, a value of 2 was noted. If the changes are localized on the gingiva around the entire tooth and occupy the gingiva

along its entire length, but there were no periodontal pockets according to the index there was a value of 3. The presence of periodontal disease was then determined through the presence and magnitude of clinical attachment loss. This criterion determines the clinical loss of attachment to each of the tooth surfaces (mesial, distal, buccal, and lingual sides). Buccal and lingual measurements are performed in the middle of the buccal or lingual surface. The middle measurement was performed during the approximal measurements in case of absence of an adjacent tooth. When measuring the clinical loss of attachment of the proximal sides in the presence of a contact tooth, the buccal parts of the interproximal surfaces were measured. The estimated values were numbered 4, 5 or 6, while in the final result the value is taken as the average for each examined tooth. The final result is obtained as a quotient of the average value of all examined teeth with the number of examined teeth.

The following criteria were taken as reference values when measuring the clinical loss of attachment: presence of clinical attachment loss up to 3 mm, presence of clinical attachment loss of 4-6 mm and presence of periodontal pocket over 7 mm. So in index value 4 was noted if the clinical loss of attachment was up to 3 mm, value 5 when clinical loss of attachment was from 4 to 6 mm and value 6 when there was presence of clinical loss of tooth attachment over 7 mm.

The dental clinical examination was performed in the long-term care institution, in the office or in the rooms of the institutionalized elderly or in a room determined for that purpose. The examination of the subjects was performed on a patient sitting on a chair, lying in bed or placed in a wheelchair.

For the examination a dental probe, a dental mirror and disposable gloves and a portable lamp for artificial illumination were used. After the examination, the used instruments and disposable medical gloves were stored in appropriate places for storage of medical waste.

The data obtained from after being collected were statistically processed. For statistical processing was used special software for statistical data processing - Statistics 7.1.

RESULTS

In this part of the paper are presented the results obtained from the research that was conducted in the period from April to July 2018 in the Department "Mother Teresa", part from the Gerontological Institute "Thirteenth November" - Skopje. It included a total number of 75 people over the age of 65 who were accommodated in the department and gave their consent to participate in the research.

According to the results, the mean age of the participants in the research was 74 years (more precisely 73.79 ± 6.92 years, with a range of 65-93 years with Confidence interval from 73.18 to 75.41 years)

After processing the data, it was found that the average length of stay in this long-term care institution for the examined elderly was 5 years and seven months on average (5.64 ± 6.92 years, range from 0.06 to 24.00 years with Confidence interval from 4.19 to 7.10 years)

The average number of present (remaining) teeth in the subjects was 5.81. 7.34 (range 0-24, with Confidence interval from 4.09 to 5.52).

The mean value of the simplified OHI Green Vermilion index obtained for the presence of dental plaque was 2.33 ± 0.51 (range from 1.33 to 3.00, with Confidence interval from 2.15 to 2.51). Most of the respondents have values above 2.00 for the simplified OHI index.

The average value for the Ramfjord index (for assessment of periodontal health) was 4.57 ± 0.74 (range 2.5 to 6.00, with Confidence interval 4.33 to 4.82) (Fig. No. 1)

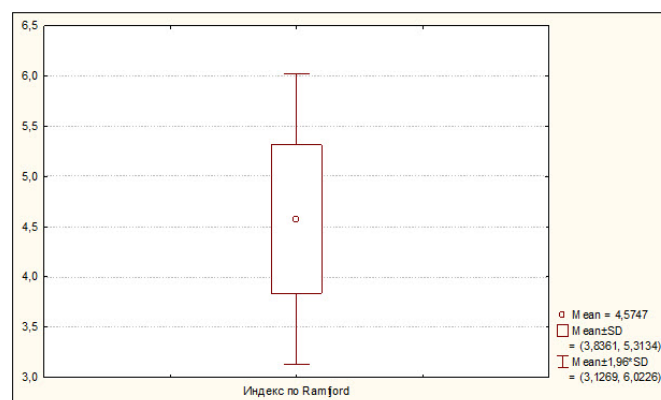


Fig. No. 1. Average value for the Ramfjord Index in the examined elderly who have natural teeth.

The average value obtained for the Ramfjord index among female subjects was 4.51 ± 0.81 , while the average value of the Ramfjord index in males was 4.63 ± 0.69 (Fig. No. 2). After statistical processing, it was found that there was no significant difference in the specific Ramfjord Index between males and females (for $p < 0.001$).

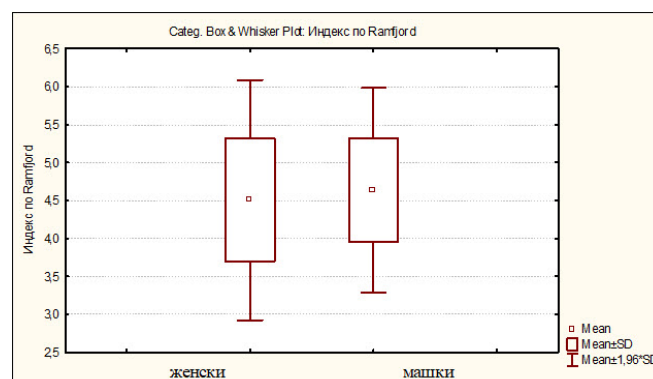


Fig. No. 2. Differences in values of the Ramfjord Index by gender among institutionalized older people

Among two (5.26%) of the subjects the changes were localized only on the gingiva. Most of the subjects after the appropriate calculation had moderately advanced periodontitis (68.42% of the subjects). (Table No. 1.)

Table No.1. Progression of periodontitis among institutionalized elderly

Ramfjord index	No	Percent
Value 4	4	10,52 %
Value 5	26	68,43 %
Value 6	6	15,79 %

DISCUSSION

This study refers to the periodontal health assessment of institutionalized elderly people institutionalized in the Department "Mother Teresa", part from the Gerontological Institute "Thirteenth November" - Skopje. It is a cross-sectional study and all the results presented in it are original.

The limiting effect of this study is the small number of people participating in this study. However, during the research, all institutionalized persons accommodated in the institution were examined. Thus the small number of participants in this study does not adversely affect the validity of the results.

The comparison of the data of this study with other epidemiological studies is complex due to the existence of numerous variations in terms of diagnostic methodology and criteria between different studies. A special problem was the lack of published data regarding the periodontal health of institutionalized elderly in our country. This prevents the possibility of comparison with our literary data.

Glazar et al. (2010) found a higher prevalence of xerostomia in the institutionalized than in the non-institutionalized elderly. Also, oral hygiene habits of institutionalized elderly people is bad and inappropriate. According to Gaiao et al. (2009) 41.3% of respondents brush their teeth at least twice a day, compared to 10.6% of subjects who never brush their teeth. About 75% of people placed in long-term care facilities have large amounts of oral debris. According to Petelin et al. (2012) 23.3% subjects brush their teeth once a day, while 48.2% brush their teeth at least twice a day. The same authors found that 8.8% of patients never brush their teeth. In our study, the percentage of people who never maintain oral hygiene is 68.5% and is one of the largest in the literature.

The Ramfjord Periodontal Disease Index from 1959 was used to assess periodontal status in the study group. It contains three basic components: a plaque component, a component associated with dental calculus and a gingival-periodontal component. Only the gingival-periodontal component is used to fulfill the purposes of this paper. This index is used to assess the presence and severity of gingivitis and periodontal disease in each individual and at the level of the entire study population.

The main disadvantage of this index is that it is not completely reliable, because it is performed only on a certain number of teeth, but it is practical and used in larger epidemiological studies. Its speed is of particular importance because it is about the elderly in whom the examination should be quite rational in time. Perhaps the most important reason for choosing this, is to measure the loss of epithelial attachment relative to the enamel-cement junction, rather than measuring the depth of periodontal pockets. (Rams et al, 1993)

Six teeth were selected to determine the index, while in the absence of any of the representative teeth, they are not replaced. But due to the large number of lost teeth, it could not be made to be applied consistently. Therefore, if one of the premolars or molars was missing, it was replaced with the first tooth that is located distally from the representative tooth, and if one of the representative incisors was missing, then it was replaced with one of the contralateral central incisions, then, if it was missing, the value for the adjacent lateral incision is preferred, and if it was missing, the value for the opposite lateral incision was taken. In case of lack of some of the replacements (absence of all incisions or absence of teeth distal from the second molar) then that tooth is not replaced, and the index is obtained from the remaining teeth.

The prevalence of periodontal age increases with age and is thought to be associated with periodontal disease and age. (Beck, 1996) Today, the modern view in periodontology is that periodontal disease in the elderly is not due to increased but is the result of the cumulative progression that occurs with age.

According to the Ramfjord index for the examined institutionalized elderly, it was found that the largest percentage of the examinees have moderately advanced periodontitis (68.43%)- Ramfjord value 5 (distance from the enamel-cement junction to the junctional epithelium was from 4 to 6 mm). Next are the subjects with a value of Ramfjord 6, subjects where the distance from the enamel-cement junction to the junctional epithelium is over 7 mm (15.73%) and the subjects with clinical loss of attachment up to 3 mm- Ramfjord 4 (10.52%). In 5.26% of the subjects the changes are localized only on the gingiva (Table No. 1)

A similar prevalence of advanced periodontal disease as demonstrated by Basima in our study. (2005) Miyazaki et al. (1991) found a lower prevalence of advanced forms of periodontal disease in institutionalized elderly people, in contrast to Morales-Suarez et al. (2011) who reported a lower prevalence. Contrary to the high prevalence of moderate periodontal disease among institutionalized elderly people in our study, Iglesias et al. (2008) and Ajwani and Ainamo (2001) showed a lower prevalence of moderate periodontal disease in institutionalized elderly people.

Although it is an older population that has poor habits for maintaining oral hygiene, there is still no high percentage of advanced periodontal disease and high value for the clinical loss of attachment. This is thought to be due to the relatively small number of remaining teeth being measured.

CONCLUSION

Based on the obtained data and subsequent analysis of the results, we can draw the following conclusions : (1) Small percentage of subjects who maintain daily hygiene of remaining teeth, (2) High percentage of subjects with unsatisfactory oral hygiene and most important there was (3) High prevalence of periodontal disease.

Conflict of interests

The author declares no conflict of interest.

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