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Evaluation of oral health status of retirement-age population in Latvia

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SUMMARY

Introduction. Latvian government Health care financing regulations do not envisage free dental care in nursing homes. Consequently, in this situation arises need to carry out comparative evaluation of oral health status and quantity indicators of dental prosthodontics among retirement-age population in Latvia.

The aim of the study was to estimate oral health and dental prosthodontics indicators among retirement-age population in Latvia.

Patients and methods. We examinated 465 retirement-age inhabitants in Latvia. We assessed dental status, quantity and quality of the existing complete dental prostheses. We also evaluated the DMF-T index.

Results. Oral health indicators among Latvian retirement-age population are better than those for nursing homes residents in the same age group. Complete dental prostheses used by nursing homes residents do not meet denture's quality criteria. Retirement-age patients have oral hygiene problems.

Conclusions. DMF-T index among Latvian retirement-age population is lower than among residents of nursing homes. The major component of DMF-T index is the number of lost teeth. The assessment of dental prostheses among residents of nursing homes showed unsatisfactory results. Retirement-age population in Latvia needs treatment of oral mucosal diseases, improvement of oral hygienic measures and increase of amount of dental prosthodontics.

Key words: oral health, edentulousness, nursing homes, prostheses.

INTRODUCTION

Age is inevitable biological condition at which the human body and dental status are undergoing significant changes. Latvian government Health care financing regulations do not envisage free dental care in nursing homes. Consequently, in this situation arises need to carry out comperative evaluation of oral health status and quantity indicators of dental prosthodontics among retirement-age population in Latvia. In the world the human life span increases and therefore increases proportion of old people in all population. Such demographics draw increased attention to researches in gerontological dentistry [1, 2].

The aim of the present study was: 1) to evaluate oral health and dental prosthodontics indicators among retirement-age population in Latvia, 2) to evaluate quantity indicators of oral health and dental prosthodontics needs among residents of Zemgale and Kurzeme nursing homes in the corresponding age group and to carry out comparative assessment of dental status and amount of dental prosthetic work.

MATERIALS AND METHODS

This study was carried out in the period between 2007–2010. We examinated 465 patients following the principle of free choice (randomised selection).

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This article presents the results of the evaluation of the oral condition in the elderly population (60-72 years of age). 116 patients were examinated in dental clinic Sandent (Riga) (control group) (24.9%), 137 (29.5%) in nursing homes of Zemgale (district of Latvia) and 212 (45.6%) in nursing homes of Kurzeme (district of Latvia). The choice of dental clinic Sandent was associated with the fact that residences of all examinated 116 patients include all Latvian districts. The examinations were done by according to unified criteria dentists using dental equipment. Dental status and quantity of prosthodontics were examinated as well as complete dentures and quality of the existing dental prostheses. In addition to objective examination, the subjects were asked about how they cared for their oral health, i.e. how many times per day they brushed their teeth, how frequently they visited the dentist, and how they evaluated their oral condition. In our study were examinated incidence of oral mucosal lesions and we also evaluated oral hygiene status. Caries incidence was assessed with DMFT index (D-decayed, M-missing, F-filling).

Data descriptive statistics were used for the analysis of patients. Results were presented as numbers (n) and percent (%). 95% confidence interval for percentage values was calculated using Wilson method. Comparisons of variables between groups and genders were applied using the Chi-square test. A p value <0.05 was considered statistically significant.

All statistical calculations were performed using SPSS 18.0 (Statistical Package for Social Sciences), CIA (Confidence Interval Analysis) and Epi Info 2000 statistical packages.

RESULTS

The mean value of DMF-T index of patients from dental clinic Sandent (control group) was 25.0±5.9 for men and 25.9±5.5 for women. The mean value of DMF-T index of nursing homes residents of Zemgale district was 25.5±7.7 for men and 27.5±6.2 for women. The mean value of DMF-T index of nursing homes residents of Kurzeme district was 28.3±5.1 for men and 29.2±5.1 for women. In the study statistically significant differences of DMF-T indices were found between patients from control group and the residents from nursing homes in Kurzeme district ($p<0.001$). In 95.2% of men in control group was found partially edentulous arches, in men from nursing homes of Zemgale district it was found in 47.0% ($p<0.001$) and in men from nursing homes of Kurzeme district – 67.7% ($p<0.001$). Partially edentulous arches was found in 93.2% of women from control group, in 36.6% ($p<0.001$) of women from nursing homes from Zemgale district and in 45.3% ($p<0.001$) of women from nursing homes of Kurzeme district. To assess the amount of dental prosthodontics needs we isolated component of missing teeth from DMF-T index. The number of missing teeth (M-T) among patients from control group was 12.0±7.9 for men and 12.8±7.8 for women, among residents of nursing homes in Zemgale district number of missing teeth (M-T) was 21.6±10.1 for men and 23.7±10.0 for women, and in Kurzeme district nursing homes residents M-T was 23.1±8.5 for men and 25.8±8.1 for women. We found out that women had statistically significantly higher number of missing teeth than men ($p^1 = 0.003$) in nursing homes of Kurzeme district, but among patients from control group and nursing homes in Zemgale district we did not find out statistically significant differences of the number of missing teeth. In 25.0% of men from control group we found untreatable teeth roots which should be extracted, in Zemgale district nursing homes residents such untreatable roots was found in 51.6% of men, and in Kurzeme district nursing homes residents it was found in 14.3% of men. Women reaching pension age had a lot of untreatable teeth roots in oral cavity: in control group – 18.8%, in Zemgale district nursing homes – 30.6% and in Kurzeme district nursing homes – 11.8%. Nursing homes residents with partially edentulous arches had few residual teeth which should be treated. After therapeutically-surgical preparation of oral cavity for prosthodontics works most part of residents in nursing homes should need complete dental prostheses. Because of the increased number of missing teeth and increased number of toothless patients in this study we evaluated prosthodontics needs with complete dentures. Toothless jaws were found in 7.1% of the examinated men of control group (n=42), and in 9.5% (n=74) of women. Toothless jaws were found in 59.1% (n=66) of the examinated men from nursing homes in Zemgale district and in nursing homes in Kurzeme district this parameter was 69.0% (n=42) (statistically significant difference with control group $p<0.001$). In Zemgale district nursing homes we found 57.7% (n=71) of women with toothless jaws and in Kurzeme district nursing homes 57.3% (n=150) of women had toothless jaws ($p<0.004$). 66.6% men with toothless jaws of control group had complete dentures, it amounts 4.8% of the total number of men from control group. 85.7% women with toothless jaws of the control group had complete dentures (it amounts 8.1% of total number of women from the control group).

Accordingly, 12.9% of patients from control group (116) had complete dentures. 17.9% of the examinated men and 75.6% of the examinated women with toothless jaws in nursing homes of Zemgale district had complete dentures (it amounts 10.6% men and 43.6% women from total number of the examinated residents of nursing homes in Zemgale). 20.7% of the examinated men and 24.4% of the examinated women with toothless jaws in nursing homes of Kurzeme district had complete dentures ($p<0.001$), it amounts 12.9% of the total number of the examined men of nursing homes in Kurzeme district and 14.0% of women ($p^1<0.001$). No one from all the examinated residents of nursing homes had made a new prosthesis during the last ten years. 66.6% of complete dentures of the control group men accorded to quality indicators (retention, support, stability, aesthetics and patient satisfaction rates with dentures), 14.3% of complete dentures of the examined men in Zemgale district nursing homes and 12.5% of complete dentures of the examined men in Kurzeme district nursing homes accorded to quality indicators. 71.4% of complete dentures of the control group women accorded to quality indicators, in Zemgale district nursing homes – 6.5% ($p<0.001$) and 14.3% ($p=0.004$) in Kurzeme district nursing homes. All the examinated patients / residents had complete dentures made using conventional denture technology. 33.3% of men in the control group with toothless jaws wish to get prostheses, in Zemgale district nursing homes – 30.8% and in Kurzeme district nursing homes – 41.4%. Women of the control group with toothless jaws were satisfied with the existing prostheses and did not express a desire to make new prostheses. In Zemgale district nursing homes 87.8% of women ($p<0.001$) had wish to get new prostheses, but in Kurzeme district nursing homes – 51.2% of women. Wish to get a new prostheses of women living in Zemgale district nursing homes was significantly more pronounced than in men ($p^1<0.001$).

14.3% of men of the control group had satisfactory oral hygiene (thin layer of plaque visible scraping with a probe), 3.0% of the examined men in Zemgale district nursing homes and 12.9% – in Kurzeme district. Medium satisfactory hygiene (medium layer of plaque visible along gingival margin, interdental space is free of plaque) was observed in 42.9% of the control group men, 39.4% of examined men in Zemgale district nursing homes and 46.8% - in Kurzeme district. Unsatisfactory oral hygiene (a lot of plaque on gingiva, interdental space is filled with plaque) was observed in 42.9% of the control group men, in Zemgale district nursing homes this parameter was 57.6% and in Kurzeme district – 40.3%. 18.9% of women of the control group had satisfactory oral hygiene, 4.2% of the examined women in Zemgale district nursing homes and 12.7% - in Kurzeme district. Medium satisfactory hygiene was observed in 43.2% of control group women, 40.8% of examined women in Zemgale district nursing homes and 58.0% – in Kurzeme district. Unsatisfactory oral hygiene was observed in 37.8% of control group women, in Zemgale district nursing homes this parameter was 54.9% and in Kurzeme – 29.3%. The analysis of the results indicates that women are more concerned about oral hygiene, however, significant difference between women's and men's oral health and prosthodontics indicators have not been observed. Oral mucosal changes and lesions were found in 42.9% of men and in 41.9% of women in the control group. In control group prevails coated tongue (21%), varices (10%), atrophic oral and lips mucosa (8%), angular cheilitis (3%), denture stomatitis (7%). In nursing homes of Zemgale oral mucosal lesions was found in 77.3% men and in 90.1% women ($p<0.001$). In that group prevails coated tongue (62%), atrophic oral and lips mucosa (34%), actinic cheilitis (22%), fissured tongue (16%), hemangiomas (14%), varices (8%). In nursing homes of Kurzeme oral mucosal lesions was found in 41.9% men and in 50.7% women. In that group prevails coated tongue (26%), atrophic oral and lips mucosa (14%), denture stomatitis (12%), varices (12%), hemangiomas (12%), angular cheilitis (8%). Dental care shortage Latvian social care centers have significantly increased the oral mucosal illnesses.

DISCUSSION

Oral health status and quantity of dental prosthodontics of residents of nursing homes and retirement-age population in Latvia is various. Patients of the control group include all Latvian districts thus make an objective assessment of oral health condition and quantity of dental prosthodontics of retirement-age population. Unfortunately, it was not possible to include in our study all the social layers of the relevant age group. In present economical situation when the country has high unemployment rate and for many poor persons dental services is becoming problematic because of financial reasons. For that reason in study we evaluated oral health parameters in patients which regularly (at least once a year) visit the dentist.

In study performed in 2005 the mean value of DMF-T index of retirement-age population in Latvia

was 24.84 [3]. This indicator is lower than our study indicators of the control group (25.0 for men and 25.90 for women), whereas DMF-T index of residents of nursing homes in Zemgale and Kurzeme is higher (in Zemgale 25.50 for men, 27.50 for women; in Kurzeme 28.30 for men, 29.20 for women). WHO studies indicate that in the developed countries DMF-T index of elderly ranges from 22 to 32 [4]. In literature we found DMF-T index: in USA– 21.90 [5], in Canada – 24.86 [6], in Australia – 24.70 [7], in Turkey – 29.30 [8], in Brazil – 30.21 [9], in Fiji Islands – 23.00 [10]. In European countries this index is similar: in Germany – 22.0 [11], in Denmark – 16.7 [12], in Croatia – 27.00 [13], in Lithuania – 25.63 [14]. Oral health status of old people living in nursing homes is different; it depends on the national socio-economic situation [8]. DMF-T index of people living in nursing homes in Canada is 24.96 [6], in Australia – 24.81 [7], in Turkey – 29.83 [8], in Brazil – 30.20 [9], in Croatia – 27.92 [13]. The number of missing teeth (M-T) in the control group in Latvia was 12.0±7.9 in men and 12.8±7.8 in women, but the number of missing teeth of residents of nursing homes in Zemgale district and Kurzeme district was twice higher. Full toothless jaws were found in 59.1% of the examined retirement-age men residents of Zemgale nursing homes and in 57.7% of women (this parameter is eight times higher than parameters of men in the control group, and six times higher than for women). In nursing homes of Kurzeme full toothless jaws were found in 69.0% of men, this parameter is nine times higher than the control group with toothless jaws. For women this parameter is six times higher than the control group (57.3%). The number of retirement-age patients with full toothless jaws in literature is various: in France – 26.9% [15], in USA – 43.1% [16], in Scotland – 51.7% [17], in Brazil – 74.9% [18], in India – 66.6% [19]. The results of our study show that 4.8% of retirement-age men and 8.1% of retirement-age women of the control group have complete dentures (it is 12.9% of the total amount of prosthodontics). In nursing homes of Zemgale district 10.6% of men and 43.6% of women at retirement-age group have complete dentures. In nursing homes of Kurzeme district 12.9% of men and 14.0% of women at retirement-age group have complete dentures. In literature the amount of prosthodontics is not divided by gender and it is noted that with the age increases the number of complete denture users: in Belgium – 47.0% [21], in Poland – 25.0% [22], in Lithuania – 14.0% [14], in Turkey – 11.9% [8]. Literature data indicate that dental prostheses often do not correspond to functional quality and therefore persons do not use removable dentures: USA – 5.2% [16], France – 12.6% [15], Brazil – 42.6% [23]. Complete dentures, correspond quality indicators in 66.6% of men and 71.4% of women of retirement-age patients of control group in Latvia. In Zemgale district nursing homes good quality complete dentures were observed in 14.2% of the examined men and in 6.5% of women. In Kurzeme district nursing homes good quality complete dentures were observed in 12.5% of the examined men and in 14.3% of women. Over the past ten years no one of the examined residents of nursing homes has made new dentures. Many Latvian retirement-age people wished to make new dental prostheses but often it is not possible because of financial circumstances.

Data of oral hygiene status of the elderly in literature is various and in most cases it is unsatisfactory [14, 15, 16, 20, 21]. Unsatisfactory oral hygiene was found in 42.9% of men and 37.8% of women of the control group. In Zemgale nursing homes unsatisfactory oral hygiene was observed in 57.6% of men and in 54.9% of women, in Kurzeme nursing homes – 40.3% of men and 29.3% of women. Unsatisfactory, indicators of oral hygiene in Latvian retirement-age population is related to irregular and of low quality performance of hygienic measures. Retirement-age population often have different oral mucosal changes and lesions, it affects in Germany – 19.55% [24], in Hungary – 10.14% [25], in China – 12 – 26% [4], in Greece – 47% [26], in Turkey – 40.7% [27] of population. Among Latvian retirement-age population oral mucosal lesions was observed in 42.9% of men and in 41.9% of women of the control group, in Zemgale district nursing homes – 77.3% of men and – 90.1% of women, and in Kurzeme district nursing homes – 41.9% of men and – 50.5% of women, which is due to poor oral hygiene and use of poor fitting dental prostheses. The findings of our study highlighted the need for a program aimed at the prevention of dental diseases in the elderly population in Latvia.

CONCLUSIONS

1. During recent years DMF-T index of Latvian retirement-age population tends to increase, and it has also significantly high ($p<0.001$) among residents of nursing homes in Latvia. The most dominant component of DMF-T index is the number of missing teeth.

2. Among Latvian retirement-age population which at least once a year visits the dentist (control group) full edentulousness is relatively rare, whereas, residents of nursing homes in Latvia mostly have completely toothless jaws ($p<0.001$).

3. In Latvian retirement-age population which regulary visit the dentist quantity indicators of

prosthodontics of complete dentures do not significantly differ from European retirement-age population's dental prosthodontics indicators. Dental prosthodontics indicators of residents of nursing homes in Latvia are unsatisfactory (p=0.004). Dental prostheses have been used for decades and many patients despite indications have been never got prostheses.

4. Latvian retirement-age population needs treatment of oral mucosal diseases, improvement of hygienic measures and missing teeth replacement. Statistically significant differences of oral health status and quantity indicators of prosthodontics between men and women were not observed. Latvian elderly population living in nursing homes require for development of oral health conception.

REFERENCES

1. Petersen PE. Continuous improvement of oral health in the 21st century – the approach of the WHO Global Oral Health Programme, The Word Oral Health Report 2003.
2. Douglass CW, Sheets CG. Patient's expectations for oral health care in the 21st century. *J Am Dent Assoc* 2000;131:3-7.
3. Urtane I, Care R, Petersen PE. The study of oral health outcomes//WHO Collaborative Centre Medical Academy of Latvia, Stomatology Institute ; 1996. p. 174-5.
4. Petersen PE, Yamamoto T. Improving the oral health of older people: the approach of the WHO Global Oral Health Programme. *Community Dent Oral Epidemiol* 2005;33:81-92.
5. Vargas CM, Yellowitz JA, Hayes KL. Oral health status of older rural adults in the United States. *J Am Dent Assoc* 2003;134:479-86.
6. Arpin S, Brodeur JM, Corbeil P. Dental caries, problems perceived and use of services among institutionalized elderly in 3 regions of Quebec, Canada. *J Can Dent Assoc* 2008;74:807.
7. Stubbs C, Riordan PJ. Dental screening of older adults living in residential aged care facilities in Perth. *Aust Dent J* 2002;47:321-6.
8. Unlüer S, Gökalp S, Doğan BG. Oral health status of the elderly in a residential home in Turkey. *Gerodontology* 2007;24:22-9.
9. Rihs LB, da Silva DD, de Sousa MdaL. Dental caries in an elderly population in Brazil. *J Appl Oral Sci* 2009;17:8-12.
10. Comfort AO, King T, Moveni M, Tuisuva J. Dental health of Fiji institutionalized elderly. *Pac Health Dialog* 2004;11:38-43.
11. Schiffner U, Hoffmann T, Kerschbaum T, Micheelis W. Oral health in German children, adolescents, adults and senior citizens in 2005. *Community Dent Health* 2009;26:18-22.
12. Krustrup U, Petersen PE. Dental caries prevalence among adults in Denmark – the impact of socio-demographic factors and use of oral health services. *Community Dent Health* 2007;24:225-32.
13. Simunković SK, Boras VV, Pandurić J, Zilić IA. Oral health among institutionalised elderly in Zagreb, Croatia. *Gerontology* 2005;22:238-41.
14. Zubiene J, Milciuviene S, Klumbiene J. Evaluation of dental care and the prevalence of tooth decay among middle-aged and elderly population of Kaunas city. *Stomatologija*. *Baltic Dent Maxillofac J* 2009;11:42-7.
15. Tramini P, Montal S, Valcarcel J. Tooth loss and associated factors in long-term institutionalised elderly patients. *Gerodontology* 2007;24:196-203.
16. Saunders R, Friedman B. Oral health conditions of community-dwelling cognitively intact elderly persons with disabilities. *Gerodontology 2007*;24:67-76.
17. Starr JM, Hall RJ, Macintyre S, Deary IJ, Whalley LJ. Predictors and correlates of edentulism in the healthy old people in Edinburgh (HOPE) study. *Gerodontology* 2008;25:199-204.
18. Colussi CF, Sérgio, Torres de Freitas SF. Edentulousness and associated risk factors in a south Brazilian elderly population. *Gerodontology* 2007;24:93-7.
19. Shigli K, Angadi GS, Hebbal M. Knowledge of prosthodontic treatment among denture-wearers and non-denture-wearers attending a dental institute in India: a survey report. *Gerodontology* 2007;24:211-6.
20. De Visschere LM, Grooten L, Theuniers G, Vanobbergen JN. Oral hygiene of elderly people in long-term care institutions – a cross-sectional study. *Gerodontology* 2006; 23:195-204.
21. De Visschere LM, Vanobbergen JN. Oral health care for frail elderly people: actual state and opinions of dentists towards a well-organised community approach. *Gerodontology* 2006;23:170-6.
22. Petersen PE. The World Oral Health Report 2003: continuous improvement of oral helth in the 21st century – the approach of the WHO Global Oral Health Programme. *Community Dent Oral Epidemiol* 2003;31:3-22.
23. Ferreira RC, Silami de Magalhães C, Moreira AN. Tooth loss, denture wearing and associated factors among an elderly institutionalised Brazilian population. *Gerodontology* 2008;25:168-78.
24. Splieth C, Sümnig W, Bessel F, John U, Kocher T.. Prevalence of oral mucosal lesions in a representive population. *Quintessence Int J* 2007;38:23-9.
25. Jahn M, Schmidt J, Fejerdy L, Tollas OL, Fejérdy P, Madléna M. The prevalence of oral mucosal lesions in Hungary. *Fogorv Sz* 2007;100:59-63.
26. Triantos D. Intra-oral findings and general health conditions among institutionalized and non-institutionalized elderly in Greece. *Oral Pathol Med* 2005;34:577-82.
27. Dundar N, Kal BI. Oral mucosal conditions and risk factors among elderly in a Turkish School of Dentistry. *Gerontology* 2007;53:165-72.

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