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Quality of Life of Patients over 65 Years Old Who Use Removable Dentures

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Abstract

Background: *Elderly patients using removable dentures experience a number of oral problems associated with mucosal traumatisation and the consequences of poor oral hygiene, which affect the patients' quality of life.*

Objectives: *The aim of this study was to assess the quality of life associated with the oral cavity in patients over 65 years of age who use removable dentures.*

Material and methods: *A group of 98 patients over 65 years of age who use removable dentures were examined with the GOHAI questionnaire. Demographic data, and information on smoking, the duration of denture use and the Fox test were also taken. The dental examination assessed the condition of the oral cavity, especially missing teeth, approximal plaque index API, gingival bleeding index SBI, and prosthetic base.*

Results: *Sperman correlation analysis showed statistically significant differences in several variables. A statistically significantly lower quality of life was found in patients who were edentulous, smoked cigarettes, had symptoms of dry mouth, prosthetic base inflammation and SBI above 50%.*

Conclusions: *Patients using removable dentures mostly lack good oral hygiene, which needs to be improved by increasing their awareness of the possible consequences of neglect. Dental care should take into account factors that affect patients' quality of life.*

Key words: *quality of life, removable dentures, GOHAI*

Introduction

As a result of changes in the demographic structure of the population in Poland, the proportion of patients over 65 years of age is steadily increasing [1]. Due to increasingly better dental care, a large proportion of the elderly, also in Poland, retain their teeth into old age. The average number of retained teeth in people aged 65–74 years in Poland in 2002 was 6.3. However, the percentage of edentulous people in Poland is still high and currently exceeds 43.9% of the population [2, 5]. At the same time, there are significant differences in the percentage of edentulous people between different European countries. In western and northern European countries, the level of edentulousness is low, ranging from 5% to 8%. On the other hand, in Central and Eastern European countries, the percentage of edentulous elderly ranges from 40% in Poland and Slovakia, 53% in Bulgaria, 69% in Albania, to 78% in Bosnia and Herzegovina [3–5]. These people mostly use removable prostheses. Depending on the quality of the prosthesis and the duration of its use, patients face problems of discomfort in the oral cavity during chewing, swallowing and pronunciation, as well as in interpersonal contacts. Embarrassment about denture problems translates into impaired social interaction [7]. The first study to assess dental patients' quality of life on the basis of the General (Geriatric) Oral Health Assessment Index (GOHAI) was conducted by Atchison K. and Dolan T. in 1990 in the United States for the purpose of studying the elderly population. Since then, this index has been a frequently used tool to assess oral health-related quality of life, worldwide and in Poland [6, 7]. In subsequent studies, it has also been used in younger people, so both alternatives of the name, Geriatric and General (Geriatric/General), are correct [8, 9]. It describes elements of oral health in relation to quality of life related to physical functioning (eating, speaking and swallowing) and psychosocial functioning (feelings of anxiety about oral health, dissatisfaction with appearance, avoidance of social contact because of oral health problems, and feelings of oral pain and discomfort) [7]. The GOHAI scale consists of 12 questions concerning the last three months of life and can be used, among

others, to assess patient satisfaction with health care, to evaluate quality of life in relation to oral health in patients with general diseases or to monitor the effects of dental treatment [10, 11].

Objectives

The aim of this study was to assess the quality of life associated with the oral cavity in patients over 65 years of age who use removable dentures.

Material and methods

Approval was obtained from the Bioethics Committee of the Medical University of Lodz (RNN/341/18/KE) to conduct the study. The study was conducted at the Institute of Dentistry in Lodz over the following 6 months. The eligibility criteria for participation in the study were the patient's age above 65 years and the use of removable dentures. Participation in the study was anonymous, voluntary and started after obtaining the written consent of the participant. Ninety-eight patients were recruited consecutively during follow-up visits. Patients excluded from the study were those who did not sign a consent form [13]. The study included an interview, a clinical examination and questionnaires. In the interview, information on age, smoking, duration of use of previous prostheses, and willingness to undergo prosthetic treatment (fabrication of new prostheses) was obtained. In the clinical examination, the following oral deficiencies were assessed: inflammation on the prosthetic base according to Newton's classification, oral hygiene on the basis of API approximal plaque index and SBI gingival bleeding index. Dental deficiencies were assessed for 3 groups (edentulous, missing more than 10 teeth, missing fewer than 10 teeth). Prosthodontic stomatopathies were divided into 2 groups, the first included those which lacked inflammation or were classified as class I according to Newton, the other included those which were classified as class II and III according to Newton. In the questionnaire part, the Fox test to assess dry mouth and a questionnaire to assess the patients' quality of life were performed. Oral

health related quality of life (OHRQoL) was assessed using the Polish version of the GOHAI (Geriatric Oral Health Assessment Index) questionnaire. This has been validated by Rodakowska et al. [10]. Coding of questions: How often have you been able to swallow freely? (No. 3), How often were you able to eat all foods without discomfort? (No. 5), How often were you satisfied or dissatisfied with the appearance of your teeth, gums or dentures? (No. 7) was reversed [7]. GOHAI scores range from 12 to 60 points calculated on a Likert scale. Scores are interpreted as follows: below 50 points – poor quality of life, 51–56 points – moderate quality of life, 57–60 points – very good quality of life.

Perception of dry mouth was assessed using the 10-question (yes/no) Fox test. For the Fox test, it was assumed that a positive response to a minimum of 3 questions out of 4 key questions (i.e., question numbers 4, 5, 6, and 9), as well as a positive response to at least one other question out of 10 questions, could suggest the presence of dry mouth.

On the basis of the collected database, statistical analysis was performed using the STATISTICA program version 13.3 (TIBCO, Poland). Group differences for the ordinal variable were compared using non-parametric Mann-Whitney U tests for two groups and non-parametric Kruskal-Wallis tests for more than two groups. At a statistically significant global p for the Kruskal-Wallis test, a post-hoc analysis was performed using the Dunn test. Differences were characterised using the median and Q1 (25% quartile) and Q3 (75% quartile), as well as statistical significance p. Statistically significant results were additionally presented using box-and-whisker plots. Correlations for ordinal variables were performed using Spearman rank correlation. Statistical significance for analyses was assumed at the level of $p<0.05$.

Results

Ninety-eight patients with removable dentures were recruited for the study – 82 of them had teeth in the mouth, 16 were edentulous. The patients were divided into three age groups, the largest group N=61 was 65–74 years old. Fifty-seven women and 41 men participated in the study.

The study showed that tobacco-smoking patients had lower GOHAI scores (median=48 (Q1–Q3=39.00–49.50), p=0.035)) than non-smoking patients. Similar differences were found among patients with inflammation on the prosthetic base (median=48 (Q1–Q3=44.00–50.00), p=0.009) and among patients classified as having dry mouth according to Fox test results (median=48 (Q1–Q3=38.00–50.00)). In addition, the GOHAI scores were much lower in edentulous patients (median=38 (Q1–Q3=35.00–47.50), p=0.003)) than in patients with any dentition. For patients with ≤10 teeth or >10 teeth, there were no significant statistical differences, and the median along with Q1 and Q3 for the GOHAI scores was the same at 49.00 (48.00–54.00) (Table 1, Figure 1). Age, gender, duration of use of removable dentures or willingness to undertake prosthetic treatment did not show statistically significant differences in GOHAI scale scores.

Examination of the correlation between the PUW and patients' GOHAI scores revealed a lack of association between the factors (p-value for Spearman rank correlation =0.181).

Only patients who had dentition (N=82) were included in the analysis of differences between values obtained for API and SBI. The analysis showed no statistically significant differences between patients with different API, while statistically significant differences (p=0.019) were found between patients with different SBI. Patients with SBI 10–29% scored much higher on the GOHAI questionnaire (median=53.50 (Q1–Q3=50.00–56.00)) than patients with more advanced periodontal inflammation with SBI>50% (median=48 (Q1–Q3=47.00–53.00)). The results are presented in Table 2 and Figure 2.

Discussion

Publications on quality of life associated with oral health conducted in Poland and Central and Eastern Europe in patients using removable dentures are scarce. In a 2017 study by Rodakowska et al., a median score of 36 and a mean score of 35.56 were obtained in 100 patients using complete dentures in the GOHAI. There was a significant statistical correlation between GOHAI

and place of residence (rural vs urban) p=0.022 and dry mouth p=0.009 [13]. Galczynska-Rusin et al. in a study of patients treated with partial and complete removable dentures obtained results comparable to our study (median 48.2) [11]. In the patients studied, declared oral health problems were statistically significantly correlated with the place of residence, perceived dryness of the mouth, difficulty in chewing and low self-assessment of oral health [11]. In our study in patients using partial and complete dentures, we obtained similar results (median 48) in patients with partial dentures. In edentulous patients, the result was even lower (median 38). However, edentulous patients were a smaller group, which may have influenced the results. In 2010, Gerritsen et al. confirmed the relationship between tooth loss and poor oral health-related quality of life [12]. According to the authors, tooth loss has a strong negative effect on OHRQol, but a complete denture, or edentulous mouth improves oral health-related quality of life [12]. In our study, edentulous patients showed poorer quality of life compared to patients with missing teeth. Our results, like those of other authors, showed a significant correlation between GOHAI and smoking p=0.035, missing teeth p=0.003, prosthetic inflammation p=0.009, and dry mouth p=0.013. To confirm the data obtained, it would be advisable to repeat the study on a larger group of patients.

Conclusions

Patients using removable dentures showed a poor quality of life in the GOHAI index. The median score (25%–75%) for the various study factors mostly oscillated below 50 points. Significant statistical differences showed that the quality of life was worsened by smoking, dry mouth symptoms and advanced inflammation on the prosthetic base, as well as coexisting gingival bleeding (SBI above 50%). Very poor quality of life was also reported in the group of edentulous patients who used complete dentures. The above data should be taken into account when planning dental treatment in the elderly.

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Tables

Table 1. Distribution of mean GOHAI scale values according to selected factors

GOHAI scale			
Factor		Mediana (25–75%)	p
Age	65–74 (N=61)	49.00 (47.00–54.00)	0.136
	75–84 (N=22)	48.00 (38.00–53.00)	
	>85 (N=15)	48.00 (34.00-50.00)	
Gender	Female (N=57)	49.00 (44.00–54.00)	0.871
	Male (N=41)	48.00 (47.00–53.00)	
Smoking	Yes (N=28)	48.00 (39.00–49.50)	**0.035***
	No (N=70)	49.50 (47.00–54.00)	
Missing teeth	Toothlessness (N = 16)	38.00 (35.00–47.50)	**0.003***
	≤10 teeth (N=10)	49.00 (48.00–54.00)	
	>10 teeth (N=72)	49.00 (48.00–54.00)	
Service life of removable dentures	>10 years (N=75)	48.00 (44.00–53.00)	0.281
	≤10 years (N=23)	49.00 (47.00–55.00)	
Interest in prosthetic treatment	Yes (N=39)	48.00 (40.00–54.00)	0.654
	No (N=59)	49.00 (46.00–53.00)	
Inflammation on the prosthetic base	Yes (N=47)	48.00 (44.00–50.00)	**0.009***
	No (N=51)	50.00 (47.00–55.00)	
Assessment of dry mouth by the Fox test	dry mouth (N=40)	48.00 (38.00–50.00)	**0.013***
	lack of dry mouth (N=58)	49.00 (48.00–55.00)	

*values <0.05

Table 2. Distribution of mean GOHAI scale values according to API and SBI

GOHAI scale			
Factor		Mediana (25–75%)	p
API (N=82)	<25% (N=6)	53.50 (50.00–57.00)	0.057
	25–39% (N=6)	53.50 (50.00–55.00)	
	40–70% (N=23)	49.00 (47.00–53.00)	
	>70% (N=47)	48.00 (47.00–53.00)	
SBI (N=82)	10–29% (N=12)	53.50 (50.00–56.00)	**0.023***
	30–50% (N=21)	49.00 (48.00–53.00)	
	>50% (N=49)	48.00 (47.00–53.00)	

*values <0.05

Figures

Figure 1. Difference in severity of GOHAI scores between A) non-smoking vs smoking patients (p=0.035); B) patients with ≤10 teeth vs edentulous (p=0.042) and patients with >10 teeth vs edentulous (p=0.002); (C) patients with inflammation on the prosthetic base vs patients without inflammation on the prosthetic base (p=0.009); (D) patients with indicated dry mouth vs no feeling of dry mouth based on Fox test (min 3 +1) (p=0.013).

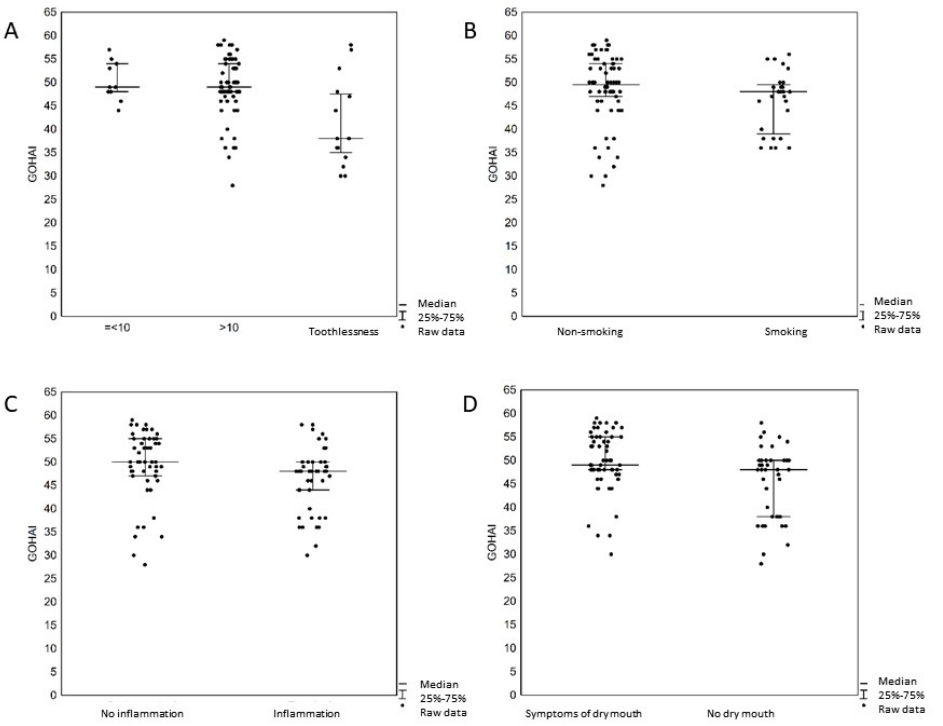

Figure 2. Differences in severity of GOHAI scores between patients with SBI 10–29% vs patients with SBI >50%.