

# ORIGINAL STUDIES

---

Scientific Article

UDC 616.314-06: 616.379-008.64

DOI: 10.17816/pmj42120-28

## DYNAMICS OF DENTAL PRESERVATION INDICATORS IN PATIENTS WITH DIABETES MELLITUS

*N.A. Shevkunova<sup>1\*</sup>, E.A. Bulycheva<sup>2,3</sup>, I.E. Kolushova<sup>1</sup>, Yu.V. Alpatева<sup>2,3</sup>*

<sup>1</sup>*Izhevsk State Medical Academy,*

<sup>2</sup>*Yaroslav-the-Wise Novgorod State University, Veliky Novgorod,*

<sup>3</sup>*I.P. Pavlov First St. Petersburg State Medical University, Russian Federation*

## ДИНАМИКА ПОКАЗАТЕЛЕЙ СОХРАННОСТИ ЗУБОВ ПАЦИЕНТОВ С САХАРНЫМ ДИАБЕТОМ

*Н.А. Шевкунова<sup>1\*</sup>, Е.А. Булычева<sup>2,3</sup>, И.Е. Колушова<sup>1</sup>, Ю.В. Алпатьева<sup>2,3</sup>*

<sup>1</sup>*Ижевская государственная медицинская академия,*

<sup>2</sup>*Новгородский государственный университет имени Ярослава Мудрого, г. Великий Новгород,*

<sup>3</sup>*Первый Санкт-Петербургский государственный медицинский университет имени И.П. Павлова, Российская Федерация*

---

**Objective.** To determine sex and age differences in dental preservation in diabetic patients.

**Materials and Methods.** 218 charts of patients with DM were selected from 4887 medical records of dental patients who visited the Republican Dental Polyclinic of Izhevsk in 2021–2023; the comparison group was formed according to the “case – control” principle. Subgroups were formed according to the WHO classifica-

---

© Shevkunova N.A., Bulycheva E.A., Kolushova I.E., Alpatева Yu.V., 2025

e-mail: shevkunova.natalia@mail.ru

[Shevkunova N.A. (\*contact person) – PhD (Medicine), Associate Professor of the Department of Orthopedic Dentistry, ORCID: 0000-0002-2540-3311; Bulycheva E.A. – DSc (Medicine), Professor, Head of the Department of Additional Education in Dental Specialties, Professor of the Department of Orthopedic Dentistry and Materials Science with a Course in Adult Orthodontics, ORCID: 0000-0002-1175-5682; Kolushova I.E. – Resident of the Department of Orthopedic Dentistry, ORCID: 0000-0003-4078-4615; Alpatева Yu.V. – PhD (Medicine), Associate Professor of the Department of Additional Education in Dental Specialties, Assistant of the Department of Orthopedic Dentistry and Materials Science with a Course in Adult Orthodontics, ORCID: 0000-0001-7112-2310].

© Шевкунова Н.А., Булычева Е.А., Колушова И.Е., Алпатьева Ю.В., 2025

e-mail: shevkunova.natalia@mail.ru

[Шевкунова Н.А. (\*контактное лицо) – кандидат медицинских наук, доцент кафедры ортопедической стоматологии, ORCID: 0000-0002-2540-3311; Булычева Е.А. – доктор медицинских наук, профессор, заведующая кафедрой дополнительного образования по стоматологическим специальностям; профессор кафедры стоматологии ортопедической и материаловедения с курсом ортодонтии взрослых, ORCID: 0000-0002-1175-5682; Колушова И.Е. – ординатор кафедры ортопедической стоматологии, ORCID: 0000-0003-4078-4615; Алпатьева Ю.В. – кандидат медицинских наук, доцент кафедры дополнительного образования по стоматологическим специальностям; ассистент кафедры ортопедической стоматологии и материаловедения с курсом ортодонтии взрослых, ORCID: 0000-0001-7112-2310].

tion: middle, elderly and old age. The number of missing and preserved teeth, the location on the jaws, and the class of the denture defect were evaluated.

**Results.** The main contingent of the municipal dental polyclinic consisted of people of retirement age – 80.7 %, working patients – 16.0 % and non-working – 3.3 %. Patients with DM amounted to 5.5 %, 93.3 % of whom were elderly and senile persons, predominantly women (75.0 %,  $p \leq 0.001$ ). The number of extracted teeth in diabetic patients was  $13.7 \pm 0.8$  in middle age,  $14.4 \pm 0.6$  in elderly and  $15.5 \pm 0.95$  in old age, which was 1.5 times larger than in the comparison group, with higher rates in the middle age group in women and on the contrary lower rates in the old and elderly age groups ( $p \leq 0.01$ ). Tooth preservation in patients with DM was 1.5 times lower and decreased with age: on an average –  $23.8 \pm 7.3$  points, in elderly age –  $26.6 \pm 2.5$  and in senile –  $22.2 \pm 2.5$  ( $p \leq 0.01$ ). The scores of women with diabetes were higher, especially in the elderly patients ( $p \leq 0.001$ ). Complete absence of teeth was observed in 89.9 % of patients with DM, more frequently on the upper jaw ( $p \leq 0.001$ ).

**Conclusions.** In patients with diabetes mellitus tooth loss occurs more quickly and is not associated with age-related changes, which is confirmed by the pronounced correlation between the absence and preservation of teeth, while in healthy patients a significant relationship between the age and the absence of teeth was established.

**Keywords.** Diabetes mellitus, tooth preservation, denture defects.

**Цель.** Определить половозрастные различия сохранности зубов у пациентов с диабетом.

**Материалы и методы.** Из 4887 медицинских карт стоматологических пациентов, обратившихся в Республиканскую стоматологическую поликлинику г. Ижевска за 2021–2023 гг., отобрано 218 карт пациентов с сахарным диабетом (СД), и сформирована группа сравнения по принципу «случай – контроль». Подгруппы подобраны в соответствии с классификацией ВОЗ: среднего, пожилого и старческого возраста. Оценивали количество отсутствующих и сохранившихся зубов, расположение на челюстях, класс дефекта зубного ряда.

**Результаты.** Установлено, что состав контингента муниципальной стоматологической поликлиники следующий: лица пенсионного возраста – 80,7 %, работающие – 16,0 % и неработающие – 3,3 %. Пациенты с СД составляли 5,5 %, из которых 93,3 % – лица пожилого и старческого возраста, преимущественно женщины (75,0 %;  $p \leq 0,001$ ). Число удаленных зубов у пациентов с диабетом составляло в среднем возрасте –  $13,7 \pm 0,8$ , в пожилом –  $14,4 \pm 0,6$  и старческом –  $15,5 \pm 0,95$ , что в 1,5 раза превышало показатели группы сравнения, при этом в средней возрастной группе у женщин показатели были выше, в пожилом и старческом – наоборот ( $p \leq 0,001$ ). Сохранность зубов у пациентов СД была в 1,5 раза ниже и уменьшалась с возрастом: в среднем –  $23,8 \pm 7,3$  балла, в пожилом –  $26,6 \pm 2,5$ , и старческом –  $22,2 \pm 2,5$  ( $p \leq 0,01$ ). Показатели женщин с диабетом были выше, особенно в старческом возрасте ( $p \leq 0,01$ ). Полное отсутствие зубов наблюдалось у 89,9 % пациентов с СД, чаще на верхней челюсти ( $p \leq 0,001$ ).

**Выводы.** У пациентов с сахарным диабетом потеря зубов происходит быстрее и не связана с возрастными изменениями, что подтверждается выраженной корреляцией между отсутствием и сохранностью зубов, в то время как у лиц без соматической патологии установлена достоверная связь между возрастом и отсутствием зубов.

**Ключевые слова.** Сахарный диабет, сохранность зубов, дефекты зубного ряда.

## INTRODUCTION

Diabetes mellitus is one of the most common socially significant diseases and a priority healthcare issue at both national and

global levels. Currently, in the Udmurt Republic, as well as nationwide, the number of people suffering from diabetes mellitus (DM) is increasing, exceeding 58 thousand individuals aged 40 to 69 years [1; 2]. The disease causes multiple changes in various body systems, in-

cluding the dentoalveolar system. It leads to xerostomia, multiple caries, periodontal diseases, and traumatic and infectious lesions of the oral mucosa, resulting in premature tooth loss [3–10].

In diabetic patients, a high incidence of caries and a high percentage of extracted teeth according to the DMFT index have been established, with 78 % experiencing a reduced quality of life due to pain, discomfort, and other oral health problems [11]. Aesthetic and functional impairments of the dentoalveolar system caused by partial tooth loss are the most common reasons for patients to visit a prosthodontist [12].

The prevalence and localization of dentition defects depend not only on the region where the study is conducted but also on the sex, age, and health status of the study group of patients [13; 14]. According to B.A. Abdullaev and S.K. Saburov, the percentage of dentition defects and their complications is rather high in patients aged 45 to 60 years suffering from type 2 diabetes mellitus [15]. In turn, maxillofacial diseases can negatively affect glycemic levels and exacerbate the course of DM [16–18].

The analysis of the prevalence of dentition defects and their complications is an important step in planning preventive and therapeutic measures. Diabetic patients represent a special group of dental patients who require close monitoring by dentists and timely care to prevent complications of both the underlying disease and dental pathologies [15; 17; 18].

*The objective of the study* was to determine gender and age differences in tooth loss and retention among patients with diabetes mellitus.

## MATERIALS AND METHODS

In a retrospective population-based study medical records of 4,887 dental patients who visited the Republican Dental Clinic in Izhevsk from 2021 to 2023 were analyzed. Screening for diabetes mellitus (DM) was performed using a specially developed "Health Questionnaire," which patients filled in during medical documentation registration. The sample revealed that 268 patients had an ICD-10-verified diagnosis of type 1 diabetes (E10, insulin-dependent) and type 2 diabetes (E11, insulin-independent), accounting for 5.5 % of all patients, or 1 in 18 individuals. Of these, 40 patients were excluded from the study due to incomplete clinical data in their medical records, while 4 young patients and 6 elderly patients were excluded due to insufficient sample size.

Thus, the study included 218 medical records of patients with DM. From the remaining 4,519 records, patients without somatic pathology were selected using a case-control approach, matched by the age and sex to the diabetic patients. As a result, age groups were formed and, in accordance with the WHO classification (1983), divided into three subgroups: the first group consisted of middle-aged individuals aged 45–60 years (3 women and 3 men), the second group included elderly individuals 61–75 years of age (86 women and 24 men), and the third group comprised individuals of advanced age, 76–90 years, (79 women and 23 men).

The integrity of the dentition was assessed based on the number of missing teeth, their location in each jaw, and the classification of

dental arch defects according to Kennedy. Quantitative assessment of tooth preservation was performed using the S.L. Baksheeva method [19], with the following interpretation: Class I indicated a high preservation level (90–100 points), Class II was considered satisfactory (80–90 points), Class III reflected a low preservation level (70–80 points), Class IV indicated a very low level (60–70 points), and Class V represented unsatisfactory tooth preservation (less than 60 points) [19].

Statistical analysis was performed using standard software packages Microsoft Excel 2010 and IBM SPSS Statistics 23, employing parametric and non-parametric methods. The Student-Bonferroni test was used to calculate the arithmetic mean ( $M$ ), standard error of the mean ( $m$ ), and probability of differences ( $p$ ). The Kruskal–Wallis test involved ranking all data, calculating rank sums for each group, computing the Kruskal–Wallis statistic ( $H$ ), and determining the significance of  $H$ . Correlation between quantitative variables was assessed using Spearman's rank correlation coefficient and Pearson's chi-square correlation coefficient.

## RESULTS AND DISCUSSION

Analysis of 4,887 medical records revealed 268 (5.5 %) patients with DM, 128 (51.2 %) of them were elderly and 122 (48.8 %) were of advanced age. Women (201, 75.0 %) outnumbered men (67, 25.0 %) by a threefold margin.

Assessment of social status of the patients at the municipal dental clinic showed that retirees constituted the majority (80.7 %), exceeding the number of employed individuals (16.0 %) by

five times and unemployed individuals (3.3 %) by 25 times ( $p \leq 0.001$ ).

The largest subgroup consisted of diabetic patients with complete tooth loss (196 cases), among whom 89.9 % were of advanced age. Complete edentulism in both jaws was observed in 12.0 % of patients, in the upper jaw only it was determined in 50.3 %, and in the lower jaw it was in 37.7 % – the rates were 1.5 times higher than in the control group ( $p \leq 0.001$ ).

Parametric analysis using the Student-Bonferroni test for independent samples demonstrated that middle-aged diabetic patients had  $13.7 \pm 0.8$  missing teeth, which was 1.7 times more than in patients of the control group ( $7.9 \pm 0.6$ ;  $p \leq 0.001$ ). Notably, in diabetic women a higher tooth loss than in diabetic men was revealed, whereas the opposite pattern was observed in non-diabetic patients ( $p \leq 0.001$ ; Table 1).

In the elderly group, diabetic patients exhibited increased tooth loss ( $14.4 \pm 0.6$ ), exceeding controls by 1.3 times ( $11.4 \pm 0.6$ ;  $p \leq 0.001$ ). Regardless of diabetic status, men had 1.2 times more missing teeth than women in this age group ( $p \leq 0.001$ ).

Among patients of advanced age, the difference in the number of absent teeth between the groups diminished: diabetics had  $15.5 \pm 0.95$  missing teeth versus  $15.0 \pm 0.8$  in controls.

However, diabetic men had 1.4 times more missing teeth ( $19.8 \pm 1.8$ ) than diabetic women, while in non-diabetic patients the gender differences were insignificant ( $p \leq 0.001$ ).

While studying tooth preservation an age-dependent decline in both diabetic and healthy groups was revealed ( $p \leq 0.01$ ).

In middle-aged diabetic patients a tooth preservation score was  $23.8 \pm 7.3$  points, in elderly patients it amounted  $26.6 \pm 2.5$  points, and in patients of advanced age the score was  $22.2 \pm 2.6$  points. Control group participants demonstrated consistently higher scores: 1.7 times higher in the 45–60 age group ( $39.1 \pm 12.1$ ), 1.3 times higher in the 61–75 age group ( $34.6 \pm 2.7$ ), and nearly identical scores in the 75–90 age group ( $21.9 \pm 2.5$ ;  $p \leq 0.01$ ; Table 2).

Table 1

### Comparative indicators of missing teeth in diabetic and non-diabetic patients by age groups and sex

№	Group	Sex	Number of patients, abs. (%)	Missing teeth			<i>p</i>
				Patients with diabetes	<i>p</i>	Patients without diabetes	
1	Middle age	Female.	3 (1.3)	$14.1 \pm 1.2$	$\leq 0.001$	$7.6 \pm 0.7$	$\leq 0.001$
		Male.	3 (1.3)	$13.2 \pm 1.0$		$8.3 \pm 0.7$	
2	Elderly	Female.	86 (37.7)	$13.7 \pm 0.7$	$\leq 0.001$	$10.8 \pm 0.9$	$\leq 0.001$
		Male.	24 (10.5)	$16.5 \pm 1.3$		$12.9 \pm 1.0$	
3	Advanced age	Female.	79 (34.6)	$14.2 \pm 1.1$	$\leq 0.001$	$14.9 \pm 1.1$	$\leq 0.001$
		Male.	23 (10.0)	$19.8 \pm 1.8$		$15.4 \pm 1.8$	

Note: statistical significance of differences ( $p_{1-2} \leq 0.001$ ;  $p_{2-3} \leq 0.001$ ;  $p_{3-4} \leq 0.001$ ).

Table 2

### Comparative indicators of tooth preservation in patients with and without diabetes mellitus by age groups and sex

№	Group	Gender	Number of patients, abs. (%)	Number of missing teeth			<i>p</i>
				Patients with diabetes	<i>p</i>	Patients without diabetes	
1	Middle age	Female.	3 (1.3)	$25.3 \pm 13.2$	$\leq 0.01$	$47.4 \pm 8.7$	$\leq 0.01$
		Male.	3 (1.3)	$22.3 \pm 9.7$		$30.7 \pm 24.1$	
2	Elderly	Female.	86 (37.7)	$27.3 \pm 2.9$	$\leq 0.01$	$34.1 \pm 3.1$	$\leq 0.01$
		Male.	24 (10.5)	$24.4 \pm 3.5$		$36.4 \pm 5.4$	
3	Advanced age	Female.	79 (34.6)	$24.1 \pm 3.0$	$\leq 0.01$	$21.6 \pm 2.8$	$\leq 0.01$
		Male.	23 (10.0)	$15.9 \pm 5.3$		$22.9 \pm 5.4$	

Note: reliability of differences:  $p_{1-2} \leq 0.01$ ;  $p_{2-3} \leq 0.01$ ;  $p_{3-4} \leq 0.01$ .

Table 3

### Characteristics of the correlation between studied indicators: age, number of missing teeth, tooth preservation

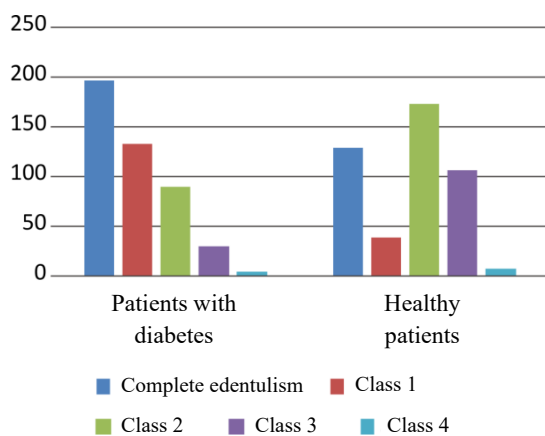
Correlation pair	Correlation indicators in patients with diabetes		Correlation indicators in healthy patients	
	Spearman correlation	Pearson correlation	Spearman correlation	Pearson correlation
Age – missing teeth	–	0.195** weak	–	–0.395** moderate
Age – tooth preservation	–0.199** weak	–	–0.298** weak	–
Missing teeth – tooth preservation	–0.723** strong	–0.789** strong	–0.149* weak	–0.205** weak

Note: \* – significance of differences  $p \leq 0.05$ ; \*\* – significance of differences  $p \leq 0.01$ .

Analysis of Table 2 data demonstrated that diabetic women consistently outperformed diabetic men in tooth preservation across all age groups. The most pronounced sex differences were observed in the advanced age group, with women's scores exceeding men's by 1.5 times ( $p \leq 0.01$ ). Conversely, in the control group, elderly men and men of advanced age showed 1.2 times better tooth preservation than women ( $p \leq 0.01$ ).

The study identified several statistically significant correlations between age and tooth loss, age and tooth preservation, tooth loss and preservation (Table 3).

Table 3 analysis revealed particularly strong correlations among diabetic patients between tooth loss and preservation. In contrast, control group participants showed moderate correlations between tooth loss and age.



*Fig. Comparative prevalence indicators of dentition defects by Kennedy Classification in diabetic patients vs healthy individuals (number of individuals)*

The analysis of dental arch defects using Kennedy's classification determined that in the

diabetes mellitus (DM) group, bilateral distal extension defects (Kennedy Class I defects) ranked first in prevalence, occurring 1.6 times more frequently in the mandible compared to the maxilla. The second most common were unilateral distal extension defects (Kennedy Class II defects) with equal distribution between the upper and lower jaws. Bounded dental arch defects in the lateral segments (Class III) were the third most frequent and also appeared with similar frequency in both jaws. Anterior bounded defects crossing the midline (Class IV) ranked fourth and were observed 1.5 times more often in the maxilla than in the mandible ( $p \leq 0.001$ , see Figure).

In contrast, the control group exhibited a different pattern of defect distribution. So, Class II defects predominated, being 1.3 times more common in the mandible. Complete tooth loss was documented in 129 patients, representing a 30.8 % lower prevalence than in patients with diabetes, with maxillary edentulism occurring 1.25 times more frequently, in this similarly to diabetic patients. Class III defects in controls ranked third and were 1.2 times more prevalent in the maxilla, while Class I defects showed equal distribution between the jaws. Class IV defects occurred 1.7 times more often in the maxilla ( $p \leq 0.001$ ).

Comparative analysis revealed Kennedy Class I defects occurring 3.4 times more often in patients with DM 3.4 times than in healthy individuals, while Class II and III defects were respectively 2 and 3.6 times less common compared to controls. The frequency of Class IV defects was similar between both groups, but complete tooth loss occurred 1.5 times more often in diabetic patients ( $p \leq 0.001$ ).

## CONCLUSIONS

The study demonstrates that tooth preservation in patients with diabetes mellitus is influenced by age-related degenerative processes and is directly associated with tooth loss, which occurs more rapidly compared to healthy individuals. This relationship is supported by a strong correlation between tooth loss and preservation in diabetic patients, whereas in non-diabetic individuals, a significant correlation exists primarily between age and tooth loss.

The age-related dynamics of tooth preservation reduction revealed most pronounced differences between patients with diabetes and without it in middle age, with moderate differences in elderly patients and minimal variations in the patients of advanced age. Tooth preservation indicators in women with diabetes were higher than those in men in each age group with the most significant gender differences observed in the oldest cohort. Conversely, in the control group, elderly male patients and those of advanced age demonstrated better tooth preservation than their female counterparts ( $p \leq 0.01$ ).

## REFERENCES

1. Dedov I.I., Sbestakova M.V., Vikulova O.K., Zheleznyakova A.V. et al. Diabetes mellitus in the Russian Federation: dynamics of epidemiological indicators according to the Federal Register of Diabetes Mellitus for the period 2010–2022. *Diabetes Mellitus* 2023; 26 (2): 104–123. DOI: 10.14341/DM13035 (in Russian).
2. Trusov V.V., Marizin S.A., Shmykova N.E., Aksenov K.V. Screening Results for Type 2 Diabetes in the Udmurt Republic. *Problems of Endocrinology* 2004; 50 (3): 10–12. DOI: 10.14341/probl11404 (in Russian).
3. Rabmayani L., Sofya P.A., Novita C.F., Sundari I., Andriany P., Kabar R.P. The behavior of patient with diabetes mellitus who wearing removable denture in caring for the removable dentures hygiene. *International Journal of Research – GRANTHAALAYAH* 2023; 11 (2): 106–114. DOI: 10.29121/granthaalayah.v11.i2.2023.4870
4. Grisi D.C., Vieira I.V., de Almeida Lima A.K., de Oliveira Mattos M.C. et al. The Complex Interrelationship between Diabetes Mellitus, Oral Diseases and General Health. *Curr Diabetes Rev.* 2022; 18 (3). DOI: 10.2174/1573399817666210322153210
5. Shevkunova N.A., Butyugin I.A., Bulycheva E.A., Valeev E.R. Vyrzhennost' stomatofobii u patsientov s sakharnym diabetom, soprovozhdayushchimsya razlitym (generalizovannym) parodontitom. *Actual Problems in Dentistry* 2024; 20 (3): 86–90. DOI: 10.18481/2077-7566-2024-20-3-86-90 (in Russian).
6. Buti F.Q., Almeida-da-Silva C.L., Huynh B. et al. Association between periodontal pathogens and systemic disease. *Biomedical Journal* 2019; 42: 27–35. DOI: 10.1016/j.bj.2018.12.001
7. Shevkunova N.A., Vorobyev M.V., Gushchin V.V. Ispol'zovanie kollagenovykh plastin pri ortopedicheskoi stomatologicheskoi reabilitatsii bol'nykh medikamentozno kompensirovannym sakharnym diabetom. *Farmateka* 2021; 28 (4): 51–54. DOI: 10.18565/pharmateca.2021.4.51-55 (in Russian).

8. Nazir M.A. Prevalence of periodontal disease, its association with systemic diseases and prevention. *Int. J. Health Sci. (Qassim)*. 2017; 11 (2): 72–80. DOI: 10.1155/2018/6924631
9. Polak D., Shapira L. An update of the evidence for pathogenic mechanisms that may link periodontitis and diabetes. *J. of Clin. Periodontol.* 2018; 45 (2): 150–166. DOI: 10.1111/jcpe.12803
10. Sanz M., Ceriello A., Buysschaert M. et al. Scientific evidence on the links between periodontal diseases and diabetes: Consensus report and guidelines of the joint workshop on periodontal diseases and diabetes by the International Diabetes Federation and the European Federation of Periodontology. *Journal of Clinical Periodontology* 2018; 45 (2): 138–149. DOI: 10.1111/jcpe.12808
11. Shevkunova N.A., Popova N.M. Kachestvo zhizni patsientov s sakharnym diabetom 2-go tipa, nuzhdayushchikhsya v stomatologicheskom ortopedicheskom lechenii. *Aspirantskiy Vestnik Povolzh'ya* 2016; 16 (5–6): 118–122. DOI: 10.17816/2072-2354.2016.05-6.118-122 (in Russian).
12. Shevkunova N.A., Redinov I.S. Vliyanie defektov zubnogo ryada na sostoyanie salivatsii i mestnogo immuniteta polosti rta u bol'nykh sakharnym diabetom 2-go tipa. *Russian Journal of Dentistry* 2016; 20 (5): 282–284. DOI: 10.18821/1728-28022016; 20(5):282-284 (in Russian).
13. Kosbelev K.A., Belousov N.N. Prognozirovaniye rezul'tatov stomatologicheskogo ortopedicheskogo lecheniya u patsientov s sakharnym diabetom. *Journal of New Medical Technologies* 2020; (5): 59–64. DOI: 10.24411/2075-4094-2020-16680 (in Russian).
14. Petrukhina N.B., Zorina O.A., Abaev Z.M. et al. Vliyanie gendernykh, vozrastnykh i metabolicheskikh faktorov na techenie khronicheskogo generalizovannogo parodontita u patsientov s metabolicheskim sindromom. *Stomatologiya* 2019; 98; 2: 31–36. DOI: 10.17116/stomat20199802131 (in Russian).
15. Abdulaev B.A., Saburov S.K. Rezul'taty izucheniya rasprostranennosti defektov zubnykh ryadov pri planirovaniy ortopedicheskoi stomatologicheskoi pomoshchi. *Avicenna Bulletin* 2018; 20 (1): 73–76. DOI: 10.25005/2074-0581-2018-20-1-73-76 (in Russian).
16. Gromova S.N., Zhukov S.A., Zabo-ev A.A., Kotelnikov L.S. et al. Otsenka stomatologicheskogo statusa bol'nykh sakharnym diabetom II tipa. *Vyatskii meditsinskii vestnik* 2024; 82 (2): 12–16. DOI: 10.24412/2220-7880-2024-2-12-16 (in Russian).
17. Avkbatcheva N.A. Osobennosti okazaniya stomatologicheskoi pomoshchi bol'nym khronicheskimi neinfektsionnymi zabol'evaniyami (na primere sakharnogo diabeta). *Nauchnye vedomosti Belgorodskogo gosudarstvennogo universiteta. Seriya: Meditsina. Farmatsiya* 2019; 42 (3): 319–326. DOI: 10.18413/2075-4728-2019-42-3-319-326 (in Russian).
18. Senina V.O., Usmanova I.N., Isbmukhametova A.N., Gerasimova L.P., Astakhova M.I., Kinzyagulova S.B. Osobennosti klinicheskikh

proyavlenii osnovnykh stomatologicheskikh zabolovanii u patsientov s sakharnym diabetom 2-go tipa (obzor literatury). *Actual Problems in Dentistry* 2022; (1): 46–52. DOI: 10.18481/2077-7566-22-18-1-46-52 (in Russian).

19. Baksheeva S.L., Gorbach N.A., Alyamovskii V.V., Mikhailova L.A. Stomatologicheskoe zdorov'e korennoho i prishlogo naseleniya Evenkii: primeneniye sposoba kolichestvennoi otsenki. *Siberian Medical Review* 2013; 4 (82); 36–38 (in Russian).

**Funding.** The study had no external funding.

**Conflict of interest.** The authors declare no conflict of interest.

**Author contributions** are equivalent.

**Limitation of the study.** The study complies with the Declaration of Helsinki and was approved by the Ethics Committees of organizations.

Received: 11/15/2024

Revised version received: 01/09/2025

Accepted: 01/20/2025

Please cite this article in English as: Shevkunova N.A., Bulycheva E.A., Kolushova I.E., Alpateva Yu.V. Dynamics of dental preservation indicators in patients with diabetes mellitus. *Perm Medical Journal*, 2025, vol. 42, no. 1, pp. 20-28. DOI: 10.17816/pmj42120-28