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СТАТИСТИЧЕСКИЙ АНАЛИЗ КЛИНИЧЕСКОГО ТЕЧЕНИЯ КАРИЕСА У ПАЦИЕНТОВ С САХАРНЫМ ДИАБЕТОМ
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STATISTICAL ANALYSIS OF THE CLINICAL COURSE OF CARIES IN PATIENTS WITH DIABETES MELLITUS
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Резюме. Сахарный диабет повышает риск развития кариеса изменением характеристик слюны. Цель исследования - оценка кариеса как индикатора гликемического контроля у пациентов с диабетом. Ретроспективное исследование не выявило значимых различий в индексе КПУ, но определило у диабетиков более низкий индекс OHI-S на фоне более высокого индекса КПИ. Таким образом, тщательный уход за полостью рта компенсирует данную предрасположенность.

Ключевые слова: кариес, сахарный диабет, гликемический контроль, здоровье полости рта, слюна.

Resume. Diabetes mellitus increases risk of caries development by altering saliva characteristics. This study assessed caries as an indicator of glycemic control in diabetic patients. A retrospective study found no significant difference in DMFT index, but identified lower OHI-S and higher CPI in diabeticindividuals. Therefore, more diligent oral care enables diabetic patients aware of their diagnosis to compensate for their predisposition to a more severe course of caries.

Keywords: dental caries, diabetes mellitus, glycemic control, oral health, saliva.

Relevance. Diabetes mellitus is a global health issue with a steady increase in morbidity both worldwide and in the Republic of Belarus. The observed increase in the number of patients with diabetes mellitus necessitates comprehensive research on providing them with medical assistance in all areas of health care, including dentistry.

Aim: to evaluate the potential use of caries as an oral indicator of poor glycemic control in patients with diabetes mellitus.

Objectives:

1. To conduct a statistical analysis of the clinical course of caries in patients with diabetes mellitus.

2. To determine strategies for correcting caries as a negative consequence of diabetes.

Materials and methods. The hypothesis chosen for this study is that diabetes mellitus may influence the severity of caries development due to reduced salivary flow and buffering capacity, changes in salivary pH, and increased glucose levels in saliva, which create favourable conditions for caries progression.

At the first stage of the research a systematic review of eLibrary and PubMed databases was performed. The keywords used included "diabetes mellitus", "dental caries", "pathogenesis" and "prevalence". The search was limited to articles whose publication date

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is no longer than 10 years. The reference lists of relevant studies and reviews were manually searched for additional reports, giving preference to meta-analyses. Four articles considered the most reliable were chosen to demonstrate the accuracy of our concept [1, 2, 3, 4].

The second stage of the research (a retrospective multicenter study) involved the analysis of 1010 out-patient medical records of patients undergoing treatment for dental caries at three large dental polyclinics located in Minsk. The study included individuals aged 18 to 98 years who visited the healthcare facilities between January 1, 2024, and April 1, 2025. Primary attention was given to patients of periodontists and dental surgeons as the chosen hypothesis suggests a negative impact of diabetes mellitus on the periodontium, which is directly relevant to their scope of treatment, necessitating a thorough assessment of diabetic status during anamnesis collection.

The following indicators were chosen for dental health assessment: age, to evaluate the distribution of caries across different age groups; The Decayed, Missing, and Filled Teeth index (the DMFT index), calculated for the assessment of caries prevalence; The Community Periodontal Index (the CPI index), calculated for the assessment of periodontal status; The Simplified Oral Hygiene Index (the OHI-S), used to assess oral hygiene status, and the presence and type of diabetes mellitus (DM). All the collected data were organized and systematized using Microsoft Excel.

Results and their discussion. The statistics presented in the reviewed articles confirmed a higher prevalence of caries in patients with diabetes, regardless of its type or the individual's age [1, 2]. There is also evidence of a relationship between diabetes and caries due to decreased salivary pH and reduced salivary flow, which creates favorable conditions for the growth of pathogenic oral microbiota and subsequent tooth demineralization [3, 4].

Diabetes mellitus was identified in 46 out of 1010 individuals (4.55%), who formed the main study group. The remaining 964 individuals constituted the control group used for comparison.

Tbl. 1. Patients' age distribution

Age/Diabetes presence	No DM		DM			
Type	–	–	1		2	
Gender	M	F	M	F	M	F
18-29	68	124	2	–	–	–
30-44	150	171	–	2	–	–
45-59	76	168	–		5	2
60 and older	50	157	1	2	9	23
Total	964		7		39	

Initial assessment indicated a worse DMFT index in diabetic patients:

Tbl. 2. The average DMFT index value in the main group and the control group

	DM (general)	DM 1	DM 2	Control group
DMFT	23 ± 8	20,5 ± 9	23,5 ± 6,6	16,2 ± 8,7

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Taking into account the patient's age distribution and the age-related characteristics of the development and clinical course of diabetes mellitus, these indicators were evaluated within age intervals of 18 to 59 years and 60 years and older.

Tbl. 3. DMFT index values

Age	Main group (DM+)	Control group (DM-)
18-59	16 ± 7	16 ± 8,6
60 and older	25 ± 8,9	25 ± 7

Within these age groups no significant differences in DMFT index were found between the main group and the control group ($p > 0.05$). This contradicts literature data indicating a higher prevalence of caries in patients with diabetes mellitus [1, 2].

Analysis of the CPI index revealed no differences between the younger groups (18–59 years), whereas among the older groups (60 years and above), as expected, the worst results were observed in the diabetic group:

Tbl. 4. CPI index values

Age	Main group (DM+)	Control group (DM-)
18-59	1,6 ± 1	1,6 ± 1
60 and older	2 ± 1,6	3 ± 1,2

Analysis of the OHI-S index revealed lower values in patients with diabetes mellitus.

Tbl. 5. OHI-S index values

Age	Main group (DM+)	Control group (DM-)
18-59	1,4 ± 0,65	0,96 ± 0,21
60 and older	1,67 ± 1,2	1,25 ± 1,3

Individuals with diabetes mellitus showed low OHI-S index values alongside relatively high CPI index values compared to the control group, suggesting a higher motivation for maintaining oral hygiene among people aware of their diabetic status. We assume that more diligent oral care enables them to compensate for their predisposition to a more severe course of caries. This generally reflects a more attentive attitude towards their own health among patients with diabetes mellitus, which may be attributed both to education provided in diabetes schools hosted by endocrinology departments of medical institutions and to effective awareness-raising efforts by dentists.

Conclusion:

1. According to the reviewed literature, patients with diabetes mellitus are at a higher risk of developing caries.

2. Meticulous oral hygiene and consistent preventive strategies can significantly reduce the risk of caries development among diabetic individuals.

3. Further research is needed to accurately investigate the relationship between diabetes mellitus and caries.

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