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### Реферати

#### ФУНКЦИОНАЛЬНИЙ СТАН СЕРЦЕВО-СУДИННОЇ І ТРАВНОЇ СИСТЕМ ОРГАНІЗМУ У СТУДЕНТІВ ПІД ЧАС ЗАНЯТЬ ФІТНЕСОМ

Сококонь О.А., Донець О. В., Донець І. М.

В роботі проведено дослідження студентів, що займаються сучасними фітнес-технологіями та встановлено, що заняття фізичними вправами впливають на активізацію роботи внутрішніх систем організму. Аналіз взаємозв'язку оздоровчого фітнесу з раціональним харчуванням студентів, дає можливість виявити перспективи покращення діяльності серцево-судинної та травної систем, покращення самопочуття та досягнення бажаних спортивних результатів студентів. За результатами дослідження було встановлено, що 92,5 % студентів позитивно віднеслися до нового змісту занять за сучасними фітнес-технологіями і лише 7,5 % своє ставлення назвали невизначеним. Під час проведення експериментальної роботи підтвердилась динаміка змін параметрів функціонального стану серцево-судинної та травної систем (експериментальна/контрольна групи): середній показник маси тіла зменшився на 2,8 кг / 1,5 кг, пульс в стані спокою знизився до 65,25 уд./хвл.  $\pm$  0,25 / 74,46 уд./хвл.  $\pm$  0,64; систолічний тиск знизився до 112,75 мм рт.ст.  $\pm$  0,35 / 118,21 мм рт.ст.  $\pm$  0,79; діастолічний тиск знизився до 72,21 мм рт.ст.  $\pm$  0,39 / 76,57 мм рт.ст.  $\pm$  0,43; життєва ємність легень збільшилась на 0,4 л / 0,2 л, що є свідченням економічної діяльності серцево-судинної системи та підтверджує доцільність використаної методики оздоровчих фітнес-технологій. Щодо доцільності змін у харчуванні: 77% студентів висловились за необхідність змін, тоді як 21% назвали зміни бажаними і лише 2% виявили небажання змінювати свій режим харчування.

**Ключові слова:** фітнес-технології, раціональне харчування, фізичне виховання, здоров'я, серцево-судинна і дихальна системи.

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#### ФУНКЦИОНАЛЬНОЕ СОСТОЯНИЕ СЕРДЕЧНО- СОСУДИСТОЙ И ПИЩЕВАРИТЕЛЬНОЙ СИСТЕМ ОРГАНИЗМА У СТУДЕНТОВ ВО ВРЕМЯ ЗАНЯТИЙ ФИТНЕСОМ

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В работе проведено исследование студентов, которые занимаются современными фитнес-технологиями и установлено, что занятия физическими упражнениями влияют на активизацию работы внутренних систем организма. Анализ взаимосвязи оздоровительного фитнеса с режимом питания студентов, дает возможность выявить перспективы улучшения деятельности сердечнососудистой и пищеварительной систем, улучшения самочувствия и достижения желаемых спортивных результатов. По результатам исследования установлено, что 92,5 % студентов позитивно отнеслись к новому содержанию занятий за современными фитнес-технологиями и только 7,5 % свое отношение назвали неопределенным. Что касается изменений в режиме питания: 77% высказались за необходимость изменений, тогда как 21% назвали изменения желаемыми и только 2% выявили нежелание изменять свой режим питания.

При проведении эксперимента подтвердилась динамика изменений параметров физического состояния организма: средний показатель массы тела снизился на 2,8 кг, пульс в состоянии покоя снизился до 65,25  $\pm$  0,25 уд./мин.; систолическое давление снизилось до 112,75 мм рт.ст.  $\pm$  0,35; диастолическое давление снизилось до 72,21 мм рт.ст.  $\pm$  0,39, что является показателем экономной деятельности сердечно-сосудистой системы.

**Ключевые слова:** фитнес - технологии, рациональное питание, физическое воспитание, здоровье, сердечно-сосудистая и пищеварительная системы.

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### EVALUATION OF ORAL HYGIENE AND DENTAL CARIES STATUS IN PATIENTS WITH BETA THALASSEMIA

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The study involved 321 patients with a homozygous form of thalassemia and 382 somatically healthy individuals. For the objective evaluation of teeth hard tissues and oral hygiene, the following clinical tests were performed: Simplified Oral Hygiene Index (OHI-S) (Green J.C., Vermillion, J. R., 1960), index by Yu.A. Fedorov and V.V. Volodkina (1971), DMFT index. Comparative analysis revealed a significant difference between the indices of the DMFT index and the index of OHI-S in the groups. There was a tendency to deterioration of the hygienic index with advancing age of patients with thalassemia. The highest values were found in the group over the age of 18 (3.60 $\pm$ 0.11). Thus, preventive dental care is a top priority for patients with  $\beta$ -thalassemia.

**Key words:**  $\beta$ -thalassemia, oral hygiene, prevention of dental diseases, dental caries.

*The study is initiative.*

Thalassemia belongs to the most common genetic diseases in the group of blood pathologies. According to the World Health Organization (WHO), there are more than 250 million thalassemia carriers in the world and about 300,000 thalassemia patients [5, 6, 8]. At present, in Azerbaijan,  $\beta$ -thalassemia major is one of the main medical and social problems of the public healthcare. According to the results of genetic studies presented to "Unisef", the frequency of thalassemia among the population in Azerbaijan is

quite significant, and it occupies one of the first places (15%) among the numerous hemoglobinopathies. Based on genetic heterogeneity, clinical and hematological variability,  $\beta$ -thalassemia can be homozygous ( $\beta$ -thalassemia major), heterozygous or complex heterozygous. The heterozygous form of the disease is the most common form with minimal clinical manifestations [1, 2].

The main pathogenetic factor of the homozygous form -  $\beta$ -thalassemia major - is the reduction or complete inhibition of  $\beta$ -globin chains. The main symptoms of this disease include, first of all, severe anemia with intense but inefficient erythropoiesis, excessive bone marrow activity and extramedullary hematopoiesis causing pronounced changes in the development of bones, including those of the face and skull [3, 4].

It should be noted that in the performed studies, the authors observed deforming expansion of the upper jaw, protrusion of the frontal teeth, distal and open bite in patients with  $\beta$ -thalassemia major [5, 11, 13]. A number of studies report that patients with  $\beta$ -thalassemia major have a higher level of tooth demineralization than the normal population. The low concentration of phosphorus and IgA in such patients' saliva makes them more prone to the dental caries development [7, 12, 14].

It should be noted that in modern clinical practice the opinion has arisen that numerous dental problems in patients with  $\beta$ -thalassemia major are due to the lack of proper attention to preventive measures and hygienic care of the oral cavity, the negligence of patients and insufficient attention of their parents to the necessary measures for the main disease [3, 6, 10]. Therefore, it is possible that pathogenetic involvement of thalassemia major can play an important role in the development of dental diseases.

**The purpose** of the study was to determine the oral hygiene indices and the dental caries intensity, depending on the age of patients with  $\beta$ -thalassemia major.

**Materials and methods.** The study was carried out at the Department of Dentistry of the Azerbaijan State Medical University and at the Thalassemia Center in Baku.

The study involved 321 patients with  $\beta$ -thalassemia major and 382 healthy persons. The study groups were divided into 4 age groups: 1- group from 3 to 5 years of age; 2- group aged from 6 to 12; 3- group aged from 13 to 17 and group 4 aged from 18 to 35. To determine the oral hygiene status, the Fedorov-Volodkina hygiene index (1971) and the simplified hygiene index (GreenJ.C., VermillionJ.R., 1960) were applied. To assess the caries intensity of tooth with DMFT, deft indices were used. PBI (Papillary Bleeding Index) were used for in assessing changes in gingival health.

The obtained digital data were subjected to statistical processing by the methods of variational (U-Mann-Whitney) and discriminant (Chi-Square) analyzes by the electronic table EXCEL-2010 and SPSS-20.

**Results of the study and their discussion.** When analyzing the oral cavity hygienic status according to Fedorov-Volodkin in the younger age group (3-5 years), no statistically reliable differences were noted. In the control group, the index was  $2.19 \pm 0.09$  versus  $2.25 \pm 0.05$  in the main group, which indicates unsatisfactory oral hygiene in the both groups of patients (table 1).

Table 1

Oral cavity hygiene index according to Fedorov Volodkin

Indices Age group	Group under study	hygiene index in points	Index assessment, number in %				
			Good (1.1-1.5)	Satisfactory (0.6-1.5)	Unsatisfactory (2.1-2.5)	Bad (2.6-3.4)	Very bad (3.5-5.0)
3-5 years of age	Main group (n-59)	$2.25 \pm 0.05$	2 (3.4 $\pm$ 2.4)	20 (33.9 $\pm$ 6.2)	19 (32.2 $\pm$ 6.1)	18 (30.5 $\pm$ 6.0)	-
	Control group (n-33)	$2.19 \pm 0.09$	2 (6.1 $\pm$ 4.2)	15 (45.5 $\pm$ 8.7)	11 (33.3 $\pm$ 8.2)	4 (12.1 $\pm$ 5.7)	1 (3.0 $\pm$ 3.0)

Note: \* - statistically significant with values ( $p < 0.05$ ); \*\* - statistically significant with values ( $p < 0.01$ ); \*\*\* - statistically significant with values ( $p < 0.001$ ).

In assessment of the deft index, reliably different results were obtained. Thus, the mean value of the index in the main group was by 1.4 times higher than the mean value in the control group ( $p < 0.05$ ).

When assessing the level of oral cavity hygiene in the age group of 6-12 years, a reliable increase of the index in the group of patients with  $\beta$ -thalassemia major ( $p < 0.001$ ) was established. Meanwhile, if a satisfactory oral hygiene index was observed in 12.8% of the patients in the control group, in the main group this index was determined in 4.3% ( $x_2 = 15.23$ ,  $p < 0.01$ ); by calculating the same DMFT/deft index, their increase was noted to be doubled in patients with  $\beta$ -thalassemia major ( $p < 0.001$ ) (table 2).

Comparing the mean indices of oral hygiene in patients with  $\beta$ -thalassemia major with somatically healthy persons in the third age group (13-18 years), a significant increase in the OHI-S index by 1.9 times ( $p < 0.001$ ) was observed. Meanwhile, satisfactory hygiene in the control group was observed in 54.1%, and in the main group only in 10.5% of the patients. Unsatisfactory oral hygiene in the control group was in 35.3% versus 24.6% in the main group.

Table 2

## Simplified Oral Hygiene Index |- OHI-S

Indices Age group	Group under study	Hygiene index in points	OHI-S assessment, number in %			
			Good (0-0.6)	Satisfactory (0.7-1.6)	Unsatisfactory (1.7-2.5)	Bad (2.6-6.0)
6-12 years	Main group (n-140)	2.98±0.07	-	6 (4.3±1.7)	43 (30.7±3.9)	91 (65.0±4.0)
	Control group (n-179)	2.56±0.07	1 (0.6±0.6)	23 (12.8±2.5)	74 (41.3±3.7)	81 (45.3±3.7)
13-18 years	Main group (n-57)	3.11±0.15***	-	6 (10.5±4.1)	14 (24.4±5.7)	37 (64.9±6.3)
	Control group (n-85)	1.62±0.09	5 (5.9±2.6)	46 (54.1±5.4)	30 (35.3±5.2)	4 (4.7±2.3)
18-35 years	Main group (n-65)	3.60±0.11***	-	2 (3.1±2.1)	5 (7.7±3.3)	58 (89.2±3.8)
	Control group (n-85)	2.13±0.10	1 (1.2±1.2)	28 (32.9±5.1)	31 (36.5±5.2)	25 (29.4±4.9)

Note: \* - statistically significant with values ( $p < 0.05$ ); \*\* - statistically significant with values ( $p < 0.01$ ); \*\*\* - statistically significant with values ( $p < 0.001$ ).

The “poor hygiene” criterion index was observed in 64.9% in the first group, and in the second group - only in 4.7% cases ( $x_2 = 65.16$ ,  $p < 0.001$ ). The mean value of the DEF index in the group of patients with  $\beta$ -thalassemia major also differed reliably and was by 1.8 times higher than in the healthy group ( $p < 0.001$ ).

When interpreting the OHI-S hygiene index values in the fourth age group (18-35 years), it was found that only 2 patients among 65 of the main group (3.1%) had satisfactory and 5 people (7.7%) unsatisfactory indicators, and the remaining 89.2% showed a poor hygienic condition of the oral cavity, which is by 2.3 times more than in somatically healthy individuals ( $x_2 = 53.72$ ,  $p < 0.001$ ).

As for the DMFT index, its mean value in the main group was  $9.18 \pm 26$ , which is by 1.5 times higher than the mean value in the control group ( $p < 0.001$ ). (table 3)

The data obtained indicate a more pronounced degree of oral hygiene index in all the main groups. Thus, it is obvious that one of the factors causing high carious injuries of teeth in talassemic patients is unsatisfactory oral hygiene.

Table 3

## Intensity of the carious process

Age groups	deft/DMFT index records	
	Main group	Control group
3-5 (deft)	$9.41 \pm 0.62^{***}$	$6.82 \pm 0.75$
6-12 (DMFT/ deft)	$9.75 \pm 0.35^{***}$	$4.84 \pm 0.25$
13-17 (DMFT)	$6.84 \pm 0.25^{***}$	$3.91 \pm 0.30$
18 -35 (DMFT)	$9.18 \pm 0.26^{***}$	$6.31 \pm 0.31$

Note: \* - statistically significant with values ( $p < 0.05$ ); \*\* - statistically significant with values ( $p < 0.01$ ); \*\*\* - statistically significant with values ( $p < 0.001$ ).

The DMFT indices and the index of oral hygiene in the second age group are higher than those of the other age groups. Studies of the age-related dynamics of oral hygiene showed that a more favorable situation was found in somatically healthy individuals.

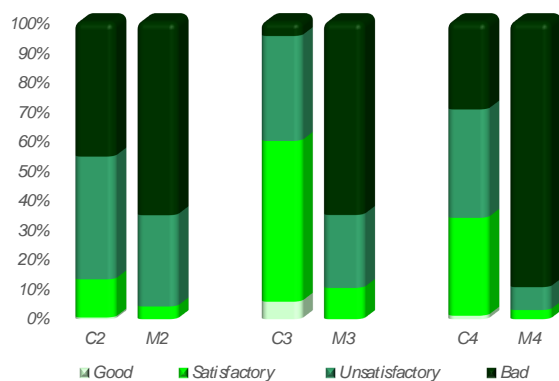


Fig. 1. Values of OHI-S hygiene index depending on age (C- control group, M-main group)

In the group of patients with  $\beta$ -thalassemia major, the level of individual oral cavity hygiene is decreasing with age (fig. 1).

As it is known, bacterial plaque resulting from poor oral hygiene is the cause of chronic inflammatory periodontal diseases. The earliest sign of inflammatory periodontal disease is the gum bleeding.

A comparative analysis of the results of the bleeding index in patients of the main and control groups aged 6-12 years revealed that mild inflammation was observed in  $14.4\% \pm 3.0$  of the patients of the main,  $46.8\% \pm 4.0$  of the children in the control groups. The moderate degree of

inflammation is present in  $52.5 \pm 4.2\%$  of the main group and in  $46.8 \pm 4.0\%$  of the control group. Severe inflammation is observed in the main and control groups, respectively, in  $33.1 \pm 4.0\%$  and  $6.3 \pm 1.9\%$ .

At the age of 13-17 years, a mild inflammation was detected in  $1.8 \pm 1.8\%$  in the main group and  $63.4 \pm 5.3\%$  in the control group, the moderate degree of inflammation was  $25.0 \pm 5.84\%$  in the main and  $35.4 \pm 5.3\%$  in the control while severe degree of inflammation was observed in  $73.2 \pm 5.9\%$  of the main and  $4.3 \pm 2.9\%$  of the control groups. In the main group of the adult population of 18-35 years old, mild inflammation was observed in  $1.5 \pm 1.5\%$ , moderate in  $26.2 \pm 5.5\%$ , and severe in  $72.3 \pm 5.6\%$  of patients. In the control group, mild inflammation was observed in  $32.9 \pm 5.1\%$ , moderate inflammation was observed in  $43.5 \pm 5.4\%$  of patients, and severe inflammation was detected in  $23.5 \pm 4.6\%$  of patients.

The results of the work of Yousif A. et al. did not show a statistical difference in the indicators of the hygiene index, the value of the DMFT index and the gingivitis index between thalassemic patients and healthy group in the younger age group [9]. However, these indicators were significantly high in thalassemic patients in the adolescent age group. The results of our study are not consistent with the results of the study by Tirumala K. et al. The study of children with  $\beta$ -thalassemia major revealed a low level of dmft index in young children and a low level of the DMFT index in teenagers [12, 14]. Dama S. et al. also did not reveal a statistically significant difference between the degree of dental caries in patients with  $\beta$ -thalassemia major and healthy group [5]. Authors Karayilmaz H., Manali A. reported higher rates of oral hygiene indices, DMFT in patients with thalassemia major compared with similar readings of the healthy group [11, 12]. The age group range in our work, absorbs shorter ranges of foreign researchers and is distinguished by a larger sample, which obviously explains the different results. Thus, our data suggest that one of the factors of high prevalence of dental caries and inflammation of periodontal tissues in patients with  $\beta$ -thalassemia major is poor oral hygiene. The provision of dental care should be considered as a necessary component of the healing of the body and the favourable course of such a complex pathology as major  $\beta$  - thalassemia.

## Conclusion

Thus, the study of the oral hygiene index and the dental caries indices in patients with  $\beta$ -thalassemia major permits to control the level of individual hygienic care, early detection of demineralization and destruction of dental hard tissues, prevention of secondary dental arch deformities and occlusion disorders. In a comprehensive study of patients with  $\beta$ -thalassemia, the importance of dentist involvement and the provision of dental care should be considered a necessary part of the body's recovery and a favorable course of such complex pathology as  $\beta$ -thalassemia major.

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## Реферати

**ОЦІНКА ГІГІЄНИЧНОГО СТАНУ ПОРОЖНИНИ РОТА ТА ІНТЕНСИВНОСТІ КАРІЄСУ ЗУБІВ У ПАЦІЄНТІВ З В-ТАЛАСЕМІЄЮ**

Шадлінська Р.В.

У дослідженні брали участь 321 пацієнта з гомозиготною формою  $\beta$ -таласемії і 382 соматично здорові особи. Для об'єктивної оцінки твердих тканин зубів і гігієни порожнини рота використовувалися клінічні тести: гігієнічний індекс Гріна-Вермільйона (Green J.C., Vermillion J.R., 1960), індекс Ю.А. Федорова і В.В. Володкіної (1971) і показник інтенсивності карієсу КПУ. При порівняльному аналізі в групах виявлена достовірна різниця між показниками індексу КПУ і індексу ОНІ-S. Спостерігалася тенденція до погіршення гігієнічного індексу зі збільшенням віку пацієнтів з  $\beta$ -таласемією. При цьому, найбільше значення виявлено в групі старше 18 років ( $3,60 \pm 0,11$ ). Більш високий ризик розвитку карієсу був виявлений в групі з  $\beta$ -таласемією в порівнянні з обстежуваним контингентом без соматичних захворювань. Профілактична стоматологічна допомога є першочерговою необхідністю для пацієнтів з великою  $\beta$ -таласемією.

**Ключові слова:**  $\beta$  - таласемія, карієс, гігієна порожнини рота, профілактика стоматологічних захворювань.

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**ОЦЕНКА ГИГИЕНИЧЕСКОГО СОСТОЯНИЯ ПОЛОСТИ РТА И ИНТЕНСИВНОСТИ КАРИЕСА ЗУБОВ У ПАЦИЕНТОВ С В-ТАЛАССЕМИЕЙ**

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В исследовании принимали участие 321 пациента с гомозиготной формой  $\beta$ -талассемии и 382 соматически здоровые лица. Для объективной оценки твердых тканей зубов и гигиены полости рта использовались клинические тесты: гигиенический индекс Грина-Вермилльона (Green J.C., Vermillion J.R., 1960), индекс Ю.А. Федорова и В.В. Володкиной (1971 г.) и показатель интенсивности кариеса КПУ. При сравнительном анализе в группах выявлена достоверная разница между показателями индекса КПУ и индекса ОНІ-S. Наблюдалась тенденция к ухудшению гигиенического индекса с увеличением возраста пациентов с  $\beta$ -талассемией. При этом, наибольшее значение обнаружено в группе старше 18 лет ( $3,60 \pm 0,11$ ). Более высокий риск развития кариеса был обнаружен в группе с большой  $\beta$ -талассемией по сравнению с обследуемым контингентом без соматических заболеваний. Профилактическая стоматологическая помощь является первостепенной необходимостью для пациентов с большой  $\beta$ -талассемией.

**Ключевые слова:**  $\beta$  – талассемия, кариес, гигиена полости рта, профилактика стоматологических заболеваний.

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**FEATURES OF THE RAYNAUD'S SYNDROME COURSE IN PATIENTS WITH RHEUMATOID ARTHRITIS**

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Often, patients with rheumatoid arthritis develop secondary Raynaud's syndrome, which is a prognostically unfavorable symptom of its course. Raynaud's syndrome is more common in patients with an existing rheumatoid factor in the blood serum. In patients with rheumatoid arthritis there is an impaired endothelium dependent vasoregulation in the shoulder artery, indicating the endothelial function disorder. In patients with rheumatoid arthritis with secondary Raynaud's syndrome, there are more pronounced signs of endothelial dysfunction, indicating a high risk of atherosclerosis and cardiovascular complications. The index of open capillaries permits to objectively assess the Raynaud's syndrome severity in patients with rheumatoid arthritis.

**Key words:** rheumatoid arthritis, Raynaud's syndrome, endothelial dysfunction.

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Rheumatoid arthritis (RA) is an autoimmune disease of unknown etiology with the development of symmetrical erosive arthritis (synovitis) and a wide range of extra-articular (systemic) manifestations [9]. This is the most common and disabling connective tissue disease (affects about 1% of the world and 0.4% of Ukrainian population) [10]. In 58.7-72% of patients with RA, comorbid conditions such as Raynaud's syndrome (RS) and arterial hypertension, which can significantly modify the course of the disease, impair the treatment efficacy and reduce the life expectancy of patients [10].

An important pathogenetic link of RA is the microcirculation system impairment, and the microvasculature serves as the target organ in which the immune, inflammatory and metabolic mechanisms of the pathological process are implemented. Disorders in the microcirculation system are associated with the systemacity of lesions, duration of the disease, antioxidant protection disorders, endothelial dysfunction indices and reliably play a leading role in the pathogenesis of RA systemic manifestations. As of today, the endothelium is known to be the target of oxidative stress, which reduces endothelium dependent vasodilatation of blood vessels, promotes the increase of cellular processes course rate and accelerates their apoptosis.