

D.G. Hajiyev

Azerbaijan Medical University, Baku, Azerbaijan

DISEASES OF THE ORAL CAVITY IN PROFESSIONAL ATHLETES ENGAGED IN VARIOUS SPORTS

e-mail: djavanshir.gadjiyev@mail.ru

475 athletes, representatives of the Olympic reserve in game and power sports, were examined during intensive training of the preparatory period of the training cycle (75 % – boys and 25 % – girls) aged 18 to 21 years. The article presents the data of scientific studies of the dental status of 200 athletes divided into groups depending on the type of sport: game types (volleyball, handball), wrestling, swimming, gymnastics, boxing. The control group consisted of 40 students of the Azerbaijan Medical University who do not have a somatic burden and are engaged in amateur sports. The prevalence of the main dental diseases was studied: caries, inflammatory periodontal diseases, using the methods and criteria proposed by WHO – the index of need for treatment of periodontal diseases, CPITN, 1980 and the CPI index. The hygienic condition of the oral cavity was determined by the OHI-S index (JC Green, JR Vermillion, 1963), gum bleeding according to Muhlemann-Cowell (SB-Index), the condition of periodontal tissues according to the PMA index (Massler, Schour (1949) modified by Parma (1960)). Inflammatory periodontal diseases are more often diagnosed in sports such as wrestling, gymnastics. The highest frequency of diagnosis of bleeding is noted in athletes – wrestlers and boxers. The lowest level of bleeding was found in representatives of game sports. When assessing the prevalence of carious disease in the wrestling and swimming group, equal values are determined – 60.0 ± 7.75 %.

Keywords: caries, periodontitis, anomalies, physical activity, need for treatment

Д.Г. Гаджисв

ЗАХВОРЮВАННЯ ПОРОЖНИНИ РОТА У ПРОФЕСІЙНИХ СПОРТСМЕНІВ, ЩО ЗАЙМАЮТЬСЯ РІЗНИМИ ВИДАМИ СПОРТУ

Було обстежено 475 спортсменів, представників олімпійського резерву в ігрових та силових видах спорту, у період інтенсивних тренувань підготовчого періоду тренувального циклу (75 % – юнаки та 25 % – дівчата) віком від 18 до 21 року. У статті наведено дані наукових досліджень стоматологічного статусу у 200 спортсменів, розділених на групи залежно від виду спорту: ігрові види (волейбол, гандбол), боротьба, плавання, гімнастика, бокс. Контрольну групу склали 40 студентів Азербайджанського медичного університету, які не мають соматичної обтяженості та займаються аматорським спортом. Вивчалася поширеність основних стоматологічних захворювань: карієс, запальні захворювання пародонту, з використанням методик та критеріїв, запропонованих ВООЗ – індексу потреби у лікуванні захворювань пародонту, CPITN, 1980 та індексу КПУ. Гігієнічний стан ротової порожнини визначали за індексом OHI-S (JC Green, JR Vermillion, 1963), кровоточивість ясен по Muhlemann-Cowell (SB-Index), стан тканин пародонту за індексом PMA (Massler, Schour (1949) в модифікації Parma (1960)). Запальні захворювання пародонту найчастіше діагностуються у таких видах спорту, як боротьба, гімнастика. Найбільша частота діагностування кровоточивості відзначається у атлетів – борців та боксерів. Найнижчий рівень кровоточивості виявили у представників ігрових видів спорту. Оцінюючи рівня поширеності каріозної хвороби групи боротьби і плавання визначаються рівні значення – $60,0 \pm 7,75$ %.

Ключові слова: карієс, пародонтит, аномалії, фізичні навантаження, потреба в лікуванні

Professional sports training and excessive physical activity against the background of psychoemotional disorders is a favorable factor leading to a decrease in the level of metabolism, immunity, and the development of various kinds of pathological disorders in various organs and systems of the body [10, 13]. Sports loads are an additional etiopathogenetic mechanism of the occurrence and development of diseases of the oral cavity. Periodic clinical and epidemiological studies of professional athletes are very important from the point of view of informing relevant organizations about the prevalence of dental morbidity and the degree of their impact on the health and performance of athletes and the timely development and implementation of appropriate preventive measures [3, 12]. Prevention of injuries and diseases of the dental system is an integral part of overall health and well-being and is a very important factor in high-achievement sports [9, 11, 14]. Pathogenetic factors leading to the development of major dental diseases and their relationship with excessive physical exertion are still poorly understood. Thus, it is necessary to note the high level of prevalence and intensity of inflammatory and destructive periodontal diseases among professional athletes of youthful age, who, along with a very high level of physical activity, especially in the pre-competition period, due to frequent travel and change of climatic conditions, and living conditions to a greater extent against the background of hormonal disorders, possible severe immunological disorders with infiltration by cells of inflammation of the vascular system and the formation of inflammatory cell infiltrates, what plays an important role in pathogenesis is adversely affected by these factors [1]. Taking into account some differences in the incidence of the oral cavity depending on the type of sport [3, 15], this study was more aimed at assessing the severity of problems associated with the dental health of elite athletes engaged in various sports.

The purpose of the study was to identify the level of dental morbidity of professional athletes with different directions of the training process.

Material and methods of research. In the period from 2015 to 2019, during the period of intensive training in the preparatory pre-competition period of the training cycle, 475 professional athletes who represented both gaming and strength sports were involved in the research, 75 % of them were boys and 25 % were female athletes aged 18–21 years (the average age was 18.4 ± 1.7 years). In order to exclude the influence of some factors on the results of research at this stage, the athletes were in the same living and eating conditions. The written consent of the athletes to participate in the research was obtained. In the course of clinical and epidemiological studies, data were recorded, according to a comparative assessment, the frequency of dental diseases in 200 athletes of the Olympic reserve and national teams, divided into several groups depending on the type of sports activity: game sports were represented by volleyball and handball, and power sports – wrestling, swimming, gymnastics, boxing. The control group consisted of 40 students of the Azerbaijan Medical University who are not engaged in professional sports and do not have somatic pathology. Age-sex indicators in the compared groups were identical.

At the first stage of the research, anamnestic data were identified and a survey of study participants was conducted to determine the frequency of athletes' visits to specialized clinics for dental care, the level and effectiveness of the care provided, the regularity of medical examination measures, as well as hygienic and preventive measures, the availability of knowledge and skills on the methods of conducting and the correct choice of means for self-monitoring oral hygiene.

When assessing the dental status of athletes in the main and control groups, clinical and instrumental dental examination and questionnaires were carried out in the process of routine medical examination in medical institutions of the Academy of Physical Culture and Sports, and the Dental Clinic of the Azerbaijan Medical University.

The level of prevalence of some dental diseases, including diseases of soft and hard tissues of teeth, inflammatory and destructive diseases of periodontal tissues, was determined using informative and the most sensitive clinical methods and criteria proposed by WHO [2], for example, the communal index of the need for treatment of periodontal diseases, CPITN, 1980, the CPI index, which allows to identify simultaneously the total number of carious (K), filled (N) and removed (Y) teeth. The state of the dental system was judged by the prevalence of dental anomalies (HFA), the dynamics of changes in some index (hygienic and periodontal) indicators: the hygienic condition of the mouth according to the OHI-S index (J C Green, JR Vermillion, 1963), the presence of bleeding gums and its degree was determined using the bleeding index according to Muhlemann–Cowell (SB – Index), the severity of pathological changes in the parotid tissues was assessed using the papillary–marginal–alveolar PMA index (Massler, Schour (1949) in the modification of Parma (1960)).

Statistical processing of the registered digital data was carried out using parametric and nonparametric methods. Quantitative features were subjected to statistical processing by calculating the arithmetic mean (M) and its error (SE). The statistical significance of the differences between the values obtained was determined by calculating the Student's t-test. The significance level $p < 0.05$ was used as the minimum acceptable. The results of clinical trials were processed on a personal computer using Microsoft Excel, Statgraft–2008, Statistica 7.0 with the calculation of standard indicators of variation statistics.

Results of the study and their discussion. In the course of clinical observations, the examined professional athletes were diagnosed with the development of pathological processes of an inflammatory and destructive nature in periodontal tissues, the prevalence of various clinical forms and severity of which was determined by analyzing statistical data presented by indices of the index of need for periodontal treatment. When comparing the results obtained in the main and control groups, pathological changes in the parotid soft tissues characterized by abundant soft and hard supra– and subgingival dental deposits were recorded in significantly frequent cases. In the course of the conducted studies, they were the most frequent, in about 30.3 % of cases, clinical manifestations of inflammatory periodontal tissue diseases among people engaged in high-performance sports (fig. 1).

Intensive physical exertion and overtraining developing against this background with a significant decrease and weakening of the functional activity of factors of both organizational and local immune protection, in our opinion, predetermines, along with the influence of other important etiological and pathogenetic mechanisms, the frequent development of periodontal pathology, its rapid transition to more severe forms and its chronization. The analysis of CPITN index indicators indicated a high level of occurrence of clinical signs of inflammatory periodontal tissue diseases of mild and moderate severity in almost all the examined groups of professional athletes. Thus, chronic generalized periodontitis was detected in 77.7 % of athletes and only in 22.3 % of cases intact periodontal disease was observed in groups of athletes. When interpreting the data obtained, it was found that the most common diseases that were diagnosed in the parotid tissues are chronic catarrhal gingivitis and chronic periodontitis of mild severity (fig. 2).

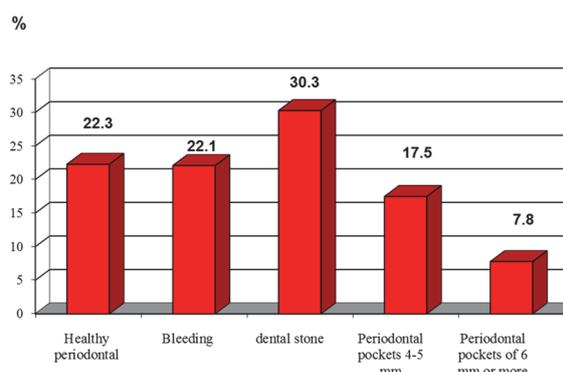


Fig.1 Frequency of clinical signs of inflammatory periodontal diseases in professional athletes (n=475)

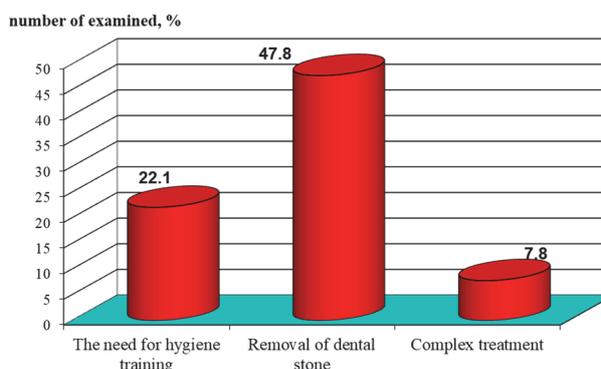


Fig. 2. The need of the examined athletes for periodontal care (n=475)

It is important to note a similar negative dynamics in the increase in the data of the studied index and in the indicators that characterized the level of need for professional athletes in complex periodontal treatment. Heavy loads during certain periods of the training cycle, especially in the pre-competition and competitive periods, lead to the deepening and chronization of pathological processes in the parotid tissues, causing a high level of need for professional athletes in complex treatment, which includes elements of surgical intervention.

At the second stage of these studies, the dental status of representatives of different sports was studied, each of which has a set of different specific etiological exogenous factors. Practically all the examined athletes engaged in various sports have a high level of major dental diseases: caries and periodontal diseases. When studying the dental status of athletes, it was found that the intensity of plaque deposits is higher in professional martial artists, as evidenced by a more pronounced deterioration in the hygienic condition of the oral cavity in wrestlers and boxers compared with persons engaged in playing sports – 2.12 ± 0.022 and 1.62 ± 0.026 points, respectively (Table 1).

Table 1

Index assessment of the oral cavity condition in athletes

Types of sports	OHI-S, scores	PMA, %	IR (by Mulleman-Cowell), scores
Game views	1.62 ± 0.026 *	3.44 ± 0.15	1.49 ± 0.022 *
Fighting	2.12 ± 0.022 *	4.53 ± 0.20 *	2.72 ± 0.026 *
Swimming	1.67 ± 0.025 *	3.78 ± 0.11 *	1.61 ± 0.020
Gymnastic	1.90 ± 0.019 *	4.36 ± 0.18 *	2.07 ± 0.045 *
Box	2.03 ± 0.029 *	3.89 ± 0.16 *	2.00 ± 0.032 *
Total	1.87 ± 0.014	4.00 ± 0.13	1.98 ± 0.015
Control	2.17 ± 0.016	3.31 ± 0.14	1.58 ± 0.017

Note: * – a significant difference from the control at $p < 0.05$.

The negative effect on the organs and tissues of the oral cavity is inherent in such sports as swimming – prolonged exposure to chlorinated water, oral breathing. For the entire group of examined professional athletes, the intensity of periodontal pathology is higher in wrestlers, where the PMA index was 4.53 ± 0.20 %, versus 3.31 ± 0.14 % of the data in the control group ($p < 0.05$). When comparing the data, depending on the type of sport, it was found that to a lesser extent pathological changes in periodontal tissues were observed in the control group of practically healthy people of the same age and gender who were not engaged in high-performance sports. It is necessary to note the relatively low values of the periodontal index of PMA in the group of handball and volleyball players.

According to the data obtained, the highest level of prevalence and intensity of the carious process is determined in those sports activities where the training process is characterized by the presence of more intensive physical and strength programs aimed at developing endurance, and the impact of some exogenous risk factors cannot be excluded. The greatest intensity of caries and deformities in the dental system was revealed in martial artists, which, in our opinion, may also be associated with wearing protective mouthguards.

Inflammatory periodontal diseases are more often diagnosed among representatives of such sports as wrestling – 82.5 ± 6.01 %, as well as people who are engaged in gymnastics – 77.5 ± 6.60 %. It is important to note that in professional athletes of all the studied groups, pathological changes of an inflammatory nature were noted more often than in the subjects included in the control group, their number was 57.5 ± 7.82 %.

Distinctive features in the frequency of occurrence of dental anomalies and deformities in the professional occupation of certain sports activities can be explained by the fact that during intense physical

exertion, very often accompanied by immunodeficiency and seasonal infectious morbidity, osteoporosis and destructive forms of periodontitis can develop. With the development of deep pathological changes and disorders in the dentoalveolar apparatus more often in boxers and gymnasts, teeth are displaced and there is an increase in the frequency of occlusion disorders, crowding of teeth and diastema.

Diseases of the oral cavity and the associated negative consequences for performance, according to our data and data from foreign authors, are common among elite athletes. Consequently, the sports environment can negatively affect the dental status of professional athletes, which must be taken into account when developing and implementing effective preventive measures throughout their activities. The data obtained during the research indicate a high level of prevalence and intensity of major dental diseases, in particular caries and periodontal diseases, in professional athletes, while it is necessary to highlight the predominance of gingivitis and periodontitis of mild severity (72.5±3.16 %). Foreign authors note the diagnosis of severe periodontal disease in 15 % of cases, and mild periodontal pathology in 76 % of professional athletes [6]. We, as well as some specialists in the field of sports dentistry, noted the difference in the prevalence of oral diseases depending on the type of sport, and gave some idea of the reasons for this difference [5, 8]. Disorders in the functional state of the organs and tissues of the oral cavity and the development of major dental diseases among athletes engaged professionally in game sports, including volleyball and handball, which are characterized by prolonged training and most often in closed rooms, where it is possible to talk about overheating of the body, especially in summer, low oxygen content and violation of thermoregulation. In this group of athletes, a high level of dental caries was detected – 52.5±7.90 % and inflammatory periodontal diseases – 62.5±7.65 %. The values of the PMA and SBI indices in this group corresponded to periodontitis of mild or moderate severity.

Athletes of other sports (gymnasts) were relatively less likely to suffer from dental caries. The frequency of detection of periodontitis was, on the contrary, higher. Martial artists involved in the training process, characterized by more intense physical and strength loads, have a greater tendency to develop major dental diseases. Thus, in boxers, the frequency of detection of dental caries was 62.5±7.65 % of cases, and the indicators of the PMA and SBI indices corresponded mainly to the moderate severity of periodontitis and were significantly higher than in other groups. A high level of dental caries incidence among martial artists (75 %) was reported in previous studies [8]. Specific training conditions distinguish swimmers who are also prone to frequent occurrence of diseases of the oral cavity, including caries and inflammatory periodontal diseases, which is confirmed by the results of studies by other authors who have revealed the frequent presence of carious spots on the teeth of athletes – swimmers who have been swimming at a competitive level for a long time [4, 7]. It should be noted that the probability of caries and inflammatory periodontal diseases in playing sports and gymnasts was lower than in representatives of power sports. The results of studies of the state of the oral cavity in professional athletes indicate a pronounced side effect on the studied factors of intensive physical training. Thus, regular screening and identification of effective strategies for preserving and strengthening dental health will help to scientifically confirm and implement the results obtained in sports medicine and minimize the side effect of the pathology itself on the productivity of professional athletes.

Conclusion

The indices obtained for some sports are important for the development of guidelines for the management of individualized training load in order to minimize physical stress and the risk of dental morbidity. In professional wrestlers and gymnasts, the indices for the occurrence frequency of pathological inflammatory disorders in periodontal disease were higher than in the control group and in representatives of other sports. Dental anomalies among athletes are detected more often than in the control group, while the maximum indicator was recorded in boxers and gymnasts.

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Y.H. Hajiyeva, A.A. Aghayev
Azerbaijan Medical University, Baku, Azerbaijan

GENDER AND AGE CHARACTERISTICS OF THE PREVALENCE OF HYPERCHOLESTEROLEMIA IN THE POPULATION

e-mail: mic_amu@mail.ru

The purpose of the study was to assess the distribution of hypercholesterolemia in the population according to gender and age characteristics. Cholesterol-metry was conducted among 2013 random residents; 887 men and 1126 women were involved in the study. After appropriate clarifications and on a voluntary basis, blood was taken from the respondents to study the content of cholesterol. According to the results of cholesterol-metry, the normal level of cholesterol was found in 21.4±0.9 % of city residents, its elevated level was correspondingly in 28.3±1.0 % ($t=5.04$; $P<0.001$), weak high level observed in 30.6±1.0 % ($t=1.63$; $P>0.05$) and very high level in 19.7±0.9 % ($t=8.07$; $P<0.001$) has been done. In our observation, 1013 out of 2013 residents had a level of cholesterol higher than 6.5 mmol/l, which indicates a high risk of cardiovascular and other diseases in the urban population. The prevalence of cholesterol is age-related, with a higher rate in women than in men. Men have less high cholesterol indicators than women. Thus, relevant studies conducted at the population level allow to identify risk groups due to hypercholesterolemia and to organize monitoring on them. At the same time, it is necessary to expand research on the identification of risk factors that play a role in the formation of hypercholesterolemia, which is very important for the effective prevention of hypercholesterolemia.

Key words: hypercholesterolemia, cardiovascular diseases risk, obesity, population

Я.Г. Гаджиєва, А.А. Агаєв

ГЕНДЕРНІ ТА ВІКОВІ ХАРАКТЕРИСТИКИ ПОШИРЕННЯ ГІПЕРХОЛЕСТЕРИНЕМІЇ У ПОПУЛЯЦІЇ

Метою дослідження було оцінити розподіл гіперхолестеринемії у популяції за статеві-віковими ознаками. Холестеринметрія проводилася серед 2013 випадкових мешканців, у дослідженні взяли участь 887 чоловіків та 1126 жінок. Після відповідних роз'яснень та у добровільному порядку у респондентів брали кров для дослідження вмісту холестерину. За результатами холестеринметрії нормальний рівень холестерину виявлено у 21,4±0,9 % жителів міста, підвищений рівень відповідно у 28,3±1,0 % ($t=5,04$; $P<0,001$), незначно високий рівень відзначений у 30,6±1,0 % ($t=1,63$; $P>0,05$) і дуже високий рівень 19,7±0,9 % ($t=8,07$; $P<0,001$). У нашому спостереженні у 1013 з 2013 жителів рівень холестерину перевищував 6,5 ммоль/л, що свідчить про високий ризик серцево-судинних та інших захворювань у міського населення. Поширеність гіперхолестеринемії залежить від віку, причому у жінок вона вища, ніж у чоловіків. Чоловіки мали нижчі показники холестерину, ніж у жінок. Отже, відповідні дослідження, що проводяться на популяційному рівні, дозволяють виявити групи ризику гіперхолестеринемії та організувати моніторинг за ними. У той же час, необхідно розширити дослідження щодо виявлення факторів ризику, які відіграють роль у формуванні гіперхолестеринемії, що є дуже важливим для ефективної профілактики.

Ключові слова: гіперхолестеринемія, ризик серцево-судинних захворювань, ожиріння, населення.

Currently, more than 80 % of deaths worldwide are caused by 4 groups of chronic non-communicable diseases (NCDs): cardiovascular diseases (CVDs), malignant tumors, diabetes, and respiratory diseases [2]. The seriousness of the NCDs problem is that it causes serious damage to the world's countries, being a medical and social problem. Even the trend of COVID-19 cannot cover up the problem of NCDs due to its importance. NCDs account for two-thirds of premature deaths, and 80 % of these cases occur in high- and middle-income countries of the world [9].