

<http://dx.doi.org/10.35630/2199-885X/2022/12/1.27>

STUDY OF CHANGES IN THE DENTAL SYSTEM DURING REPETITIVE PHYSICAL LOADING

Received 10 December 2021;
Received in revised form 10 January 2022;
Accepted 12 January 2022

Anna Teplova[✉] , Galina Emelina ,
Marina Suvorova 

Penza State University, Penza, Russian Federation

✉ stomannavaleryevna@mail.ru

ABSTRACT — THE AIM OF THE STUDY is to assess the impact of professional physical activity on the dental status of cheerleaders with constantly recurring physical load. At the moment, the impact of serious physical load on individual organs, tissues of the human body and on dental health has not been studied enough. Physical exercises with weights affect the condition of the hard tissues of the teeth, periodontal and temporomandibular joint.

MATERIALS AND METHODS: The studies were carried out by the method of clinical examination, the prevalence of pathological changes in the temporomandibular joint, damage to the tongue, teeth erasability were evaluated.

RESULTS AND DISCUSSION: The results of studies on the prevalence of tooth abrasion, tongue damage and pathological changes in the temporomandibular joint in cheerleader athletes with professional sports experience of more than 5 years are worse than in cheerleader athletes with professional sports experience of 2 to 5 years.

CONCLUSION: All the results show that a professional sport has a significant impact on the dental system, contributes to the development of pathological changes. It is necessary to develop tools and materials for the effective prevention of teeth erasure, tongue damage and pathological changes in the temporomandibular joint in order to avoid possible consequences.

KEYWORDS — cheerleader athletes, teeth erasability, temporomandibular joint, tongue, dental status, dentistry.

INTRODUCTION

The last century was a century of rapid development of sports. Cheerleading is one of the newly emerged sports. To date, it is impossible to achieve success in cheerleading without having a sufficiently high level of flexibility, endurance, and coordination abilities [3, 9, 13].

It is known that regular physical exercises are of great importance for strengthening health, increasing the stability and resistance of the body [1, 5–7]. However, excessive physical exertion can contribute to an increase in the morbidity of athletes (including dental) [11]. In B. Reid studies, the prevalence of untreated caries and oral pain among 9620 athletes

of Special Olympics was estimated. The prevalence of oral pain and untreated caries was 13.5% and 30.4%, respectively [10]. Thus, athletes are more likely than their non-sports peers to have anomalies of teeth and jaws, the prevalence and intensity of caries, dental injuries and maxillofacial injuries are higher [2, 4]. A feature of the physical exertion of cheerleader athletes is the constant jumping from a height, in which there is a strong compression of the jaws, the load on the temporomandibular joint. With constant jumps, accidental injury to the tongue is also possible. More often under the influence of physical activity among athletes cheerleaders determine the presence of pathological changes in the temporomandibular joint (looseness of the temporomandibular joint, "clicky" jaw pain dysfunction syndrome of the temporomandibular joint), occlusion, dental abrasion (proximal and occlusal abrasion, professional teeth grinding), periodontal disease (gingivitis, periodontitis), tooth decay, tongue damage [10–12].

MATERIALS AND METHODS

Our study was conducted by the method of clinical examination of cheerleader athletes who experience constantly recurring physical activity. The study involved 30 people.

The criteria for inclusion in this study were: constant physical professional activity for more than 2 years, the presence of voluntary informed consent. The exclusion criteria for this study were: constant physical professional activity for less than 2 years, refusal to participate in the survey.

According to their professional sports experience, the subjects were divided into 2 groups (15 people each): Group 1 – cheerleader athletes performing from 2 years to 5 years; group 2 — cheerleader athletes who performed above 5 years.

Before determining the indicators necessary for the study, a standard examination of the dental patient was carried out. During the clinical examination, the configuration of the face, skin color, and the presence of pathological formations on it were evaluated. Regional lymph nodes were palpated: mandibular, chin, occipital, cervical. The degree of mouth opening and temporomandibular joint (TMJ) were evaluated, namely: symmetry, smoothness of movements, to determine the deviation of the lower jaw. Next, the vestibule of the oral cavity was examined (mucosa,

ducts of the salivary glands, frenulum of the lips, depth of the vestibule) and occlusions were evaluated. Then an examination of the oral cavity itself: the oral cavity and the tongue. During the examination of the dentition and teeth, probing and percussion of the teeth were performed.

Directly for this clinical study, it was necessary to assess the prevalence of tooth abrasion, tongue damage and pathological changes in the temporomandibular joint.

RESULTS AND DISCUSSION

When analyzing the prevalence of tongue injuries in cheerleaders: in group 1 (15 people) — 20% of the prevalence of tongue injuries; in group 2 (15 people) — 53.3%.

According to the results of a clinical examination of the prevalence of pathological changes in the temporomandibular joint in cheerleaders, it was found that in group 1 (15 people) — 13.3% of the prevalence of pathological changes in the temporomandibular joint; in group 2 (15 people) — 46.6%.

The analysis of the clinical examination of the prevalence of tooth erosion in cheerleader athletes was carried out and it was found that in 15 people from group 1, the prevalence of tooth erosion was 26.6%; from group 2 (15 people) — 60%.

All these results prove that with constant physical exertion for more than 5 years, the prevalence of tooth abrasion, changes in the temporomandibular joint and damage to the tongue is greater than that of cheerleader athletes who have a professional sports experience of 2 to 5 years.

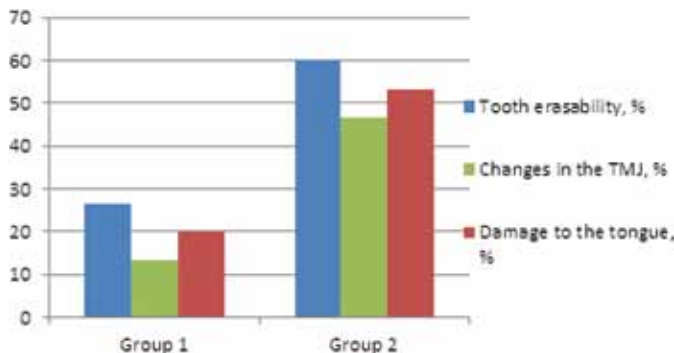


Fig. 1. Prevalence of pathological changes in the dentofacial region in cheerleader athletes

CONCLUSION

1. The results obtained indicate a high rate of increase in the prevalence of pathological changes in the dental system, such as tooth abrasion, dysfunction of the temporomandibular joint, tongue damage, in cheerleaders due to an increase in sports professional experience.

2. Cheerleader athletes with 2 to 5 years of professional sports experience have significantly bet-

ter prevalence rates of pathological changes in the maxillofacial region than cheerleader athletes with more than 5 years of professional sports experience. From this it follows that it is necessary to develop tools and materials for the effective prevention of damage to the tongue and pathological changes in the temporomandibular joint in order to avoid possible consequences.

3. It is necessary to introduce wearing a protective mouthguard by cheerleader athletes on both jaws during physical load, preventive examinations by a dentist every 3 months, to have a dental cleaning every 6 months or, if necessary, to teach cheerleaders proper oral hygiene. If the recommendations are followed, the likelihood of any pathological changes due to constant physical exertion decreases.

REFERENCES

1. **AMIRKHANYAN M. A., GRISHKOVA N.O.** Algorithm of dental rehabilitation of athletes of national teams: textbook. – method. stipend. FMBA of Russia. – M., 2014. – 14 p.
2. **VOLOGDA M.V., DOROZHINA E.G., MIKHALCHENKO D.V.** Signs of craniomandibular dysfunction in patients in need of dental treatment. Bulletin of the Volgograd State Medical University. 2018. No. 1 (65). pp. 17–22.
3. **KOSTYUK Z. M.** The study of the features of dental pathology of the oral cavity of athletes of various sports / Z. M. Kostyuk, A. G. Ponomareva, V. N. Tsarev, M. V. Krivoschchapov // Bulletin of Sports Science. – 2014. – No. 2. – pp. 38–41.
4. **KUZMINA ZH. I.** Features of the state of oral hygiene of highly qualified athletes // Young scientists in medicine: materials of the XV All-Russian Scientific and Practical Conference – Kazan, 2010. – pp. 188–189.
5. **LOBANOVA V. A.** The study of dental status in athletes of the Samara region / V. A. Lobanova // Topical issues of dental practice. – Samara, 2007. – pp. 188–189.
6. **SHAKHLINA L.** Physical rehabilitation. Modern aspects / Pedagogy, psychology and methodological and biological problems of physical education. – 2012. – No. 9. – pp. 98–113.
7. **BRENDA J. SHIELDS, GARY A. SMITH.** Cheerleading-related injuries in the United States: a prospective surveillance study. On Train Observation J Athl. 2009 November-December; 44(6):567–577. doi: 10.4085/1062-6050-44.6.567
8. **EMELINA G.V., SUVOROVA M.N., GERASHCHENKO S.M., GERASIMOVA TV., EMELINA**

- E.S. Comparative analysis of dental morbidity as a basis of people's demand for dental services. *Journal of Pharmaceutical Sciences and Research*. 2018. Vol. 10. № 4. P. 798–799.
9. **EMELINA G.V., SUVOROVA M.N., ZYULKINA L.A., KUZNETSOVA N.K., EMELINA E.S.** Evaluation of the frequency of cases of periodontal tissue inflammation in the Penza region. *Journal of Pharmaceutical Sciences and Research*. 2018. Vol.10. No. 4. pp. 973–975.
10. **B. REID, RONALD CHENETTE, M. MACEK.** Prevalence and predictors of untreated caries and oral pain in Olympic athletes. *Spec. Care in Dentistry*. – 2003. – Vol. 23, No. 4. – pp.139–142. DOI:10.1111/J.1754-4505.2003.TB00300.X
11. **SEVBITOV A.V., ENINA YU.I., DOROFEEV A.E., KAMENSKOV P.E., KOZHEMOV S.I., NIKONOVA A.V.** Investigation of the influence of various abrasive factors on the microrelief of the surface of hybrid ceramic orthopedic structures. *Option*. 2019. Vol. 35. No. Special Edition 24. pp. 598–611.
12. **SEVBITOV A.V., ENINA Y.I., DOROFEEV A.E., MIRONOV S.N., BRAGO A.S.** Experience in the application of hybrid ceramic restorations in the cervical region. *Asian Journal of Pharmaceutics*. 2018. Vol. 12. No 3. P. S1106–S1109.
13. **SEVBITOV A.V., TIMOSHIN A.V., DOROFEEV A.E., DAVIDYANTS A.A., ERSHOV K.A., KUZNETSOVA M.YU.** Comparative characteristics of the state of hard dental tissues in drug-dependent patients who use heroin, and methadone as replacement therapy. *Periodico Tche Quimica*. 2020. Vol. 17. No 34. P. 135–146.