AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE
ISSN: 2996-5101 (online) | ResearchBib (IF) = 10.81 IMPACT FACTOR
Volume-4| Issue-5| 2026 Published: |30-05-2026

THE EFFECT OF PROBIOTIC THERAPY ON CYTOLOGICAL PARAMETERS IN THE TREATMENT OF INFLAMMATORY DISEASES OF THE MAXILLOFACIAL REGION

https://doi.org/10.5281/zenodo.20248712

Nabiev R.Kh.
doctoral candidate of the Department of Maxillofacial Surgery of the Tashkent State Medical University. https://orcid.org/0009-0008-6493-6883

Abstract

Inflammatory diseases of the maxillofacial region are characterized by rapid infection spread and severe clinical manifestations, making optimization of treatment approaches highly important. This study aimed to compare the cytological effectiveness of traditional local therapy and probiotic-assisted treatment in patients with odontogenic phlegmons. A total of 41 patients with maxillofacial phlegmons were examined. The control group (20 patients) received conventional treatment, while the experimental group (21 patients) additionally underwent local wound irrigation with the probiotic solution “Probiomix” (10 g/L). Cytological examinations were performed on days 1–2, 3–4, and 6–7. The probiotic group demonstrated faster reduction of purulent exudate, earlier wound cleansing, decreased neutrophilic infiltration, and accelerated regenerative changes compared with the traditional treatment group. In the control group, inflammatory cytological features persisted for a longer period.

The results suggest that local application of the probiotic solution “Probiomix” improves the effectiveness of treatment for inflammatory diseases of the maxillofacial region and promotes faster wound healing and tissue regeneration.

Keywords

cytology, inflammatory diseases, probiotic, antibacterial therapy, purulent infiltration, granulation tissue, regeneration, maxillofacial region, cytological study, local treatment, Probiomix

Introduction. The need to improve treatment strategies for inflammatory diseases is driven by their increasing incidence and clinical complexity. It is crucial to investigate new diagnostic and therapeutic methods, as well as their impact on disease outcomes. Cytological characterization of phlegmon can provide a better understanding of its pathogenesis and help tailor treatment to individual patient characteristics. Despite a large number of studies on the surgical treatment of

AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE
ISSN: 2996-5101 (online) | ResearchBib (IF) = 10.81 IMPACT FACTOR
Volume-4| Issue-5| 2026 Published: |30-05-2026

purulent-inflammatory diseases of the orofacial region, many challenges in postoperative management remain unresolved [1-5].

Inflammatory diseases of the maxillofacial region are among the most common and severe complications in dentistry. They are characterized by the rapid spread of infection, involvement of soft tissues, and a high risk of generalized inflammation. Odontogenic phlegmons and abscesses are particularly dangerous due to the anatomical features of this region, which necessitates timely diagnosis and the selection of an optimal treatment strategy [6-8].

Despite advances in surgical and antibacterial therapies, the postoperative management of patients with purulent-inflammatory processes remains a pressing issue. Traditional treatment regimens include incision and drainage of the lesion, systemic antibiotic therapy, and local antiseptic wound care. However, these methods do not always ensure rapid sanitization of the infectious focus and complete tissue regeneration, which can lead to complications and a prolonged disease course [1-8].

In recent years, researchers' attention has been drawn to probiotics as an adjunctive therapy for inflammatory diseases. Their local application helps normalize the microbiota, suppress pathogenic flora, stimulate local immunity, and activate regenerative processes. The inclusion of probiotics in the comprehensive treatment of purulent-inflammatory diseases of the maxillofacial region is considered a promising approach that can enhance therapeutic efficacy and reduce healing time [9-17].

The cytological method of investigation is particularly significant in evaluating treatment effectiveness. It allows for an objective assessment of the dynamics of the inflammatory process, the nature of cellular infiltration, and the degree of reparative changes at the site of the lesion. A comparative cytological analysis of the traditional approach versus the use of probiotics makes it possible to identify the advantages of new therapeutic strategies and develop recommendations for clinical practice.

The diagnosis and treatment of odontogenic phlegmons are a current problem due to the prolonged tissue healing process. One of the urgent tasks in maxillofacial surgery is to find and improve treatment methods, incorporating new approaches to resolve these defects.

An infectious-inflammatory process in the perimaxillary tissues, predominantly affecting the cellulofascial spaces, can arise independently; however, it is more often a consequence of the spread of infection from periodontal tissues and is therefore considered odontogenic.

AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE
ISSN: 2996-5101 (online) | ResearchBib (IF) = 10.81 IMPACT FACTOR
Volume-4| Issue-5| 2026 Published: |30-05-2026

Odontogenic phlegmons are serious infectious complications resulting from the spread of infection from the teeth and surrounding tissues. These conditions can lead to severe consequences, including sepsis and the need for surgical intervention. The problem lies in the insufficient effectiveness of existing treatment methods, which underscores the need to improve therapeutic strategies.

Analyzing modern approaches to the treatment of odontogenic phlegmons and evaluating their effectiveness based on the cytological characteristics of these diseases is a pressing task in modern medicine.

The relevance of this topic is driven by the rising incidence of odontogenic phlegmons both in Uzbekistan and worldwide, which necessitates the development of more effective treatment and diagnostic methods. In the context of modern healthcare, where infectious diseases are becoming increasingly prevalent, it is important to find new treatment approaches.

Thus, the relevance of this study is determined by the need to improve methods of local treatment for inflammatory diseases of the maxillofacial region. A comparative cytological assessment helps to substantiate the rationale for using probiotics in comprehensive therapy and to determine their place in modern surgical dentistry.

Objective: The objective of this study is to analyze modern methods for treating odontogenic phlegmons and to investigate their cytological characteristics. This will enable the development of recommendations for optimizing treatment strategies and improving clinical outcomes.

Materials and Methods. For cytological analysis, 41 patients with phlegmon of various localizations in the maxillofacial region were selected. The 20 patients in the control group were treated traditionally: after incision of the purulent focus and antibiotic therapy, the wound was locally irrigated with a 1% chlorophyllipt solution and 3% hydrogen peroxide. In Group II, which included 21 patients with inflammatory diseases of the maxillofacial region and neck, local treatment involved the use of a probiotic solution, "Probiomix," at a concentration of 10 g/l in physiological saline, in addition to traditional treatment. The purulent wound was treated daily until purulent discharge ceased. In both groups, the analysis was conducted at 1-2 days, 3-4 days, and 6-7 days.

Results. Cytological examination of wound smears revealed acute diffuse purulent inflammatory infiltration of the wound surface on days 1-2. Changes in the dynamics of local signs were observed during topical treatment, which included daily rinsing of the wound with the probiotic solution "Probiomix" until purulent discharge ceased.

AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE
ISSN: 2996-5101 (online) | ResearchBib (IF) = 10.81 IMPACT FACTOR
Volume-4| Issue-5| 2026 Published: |30-05-2026

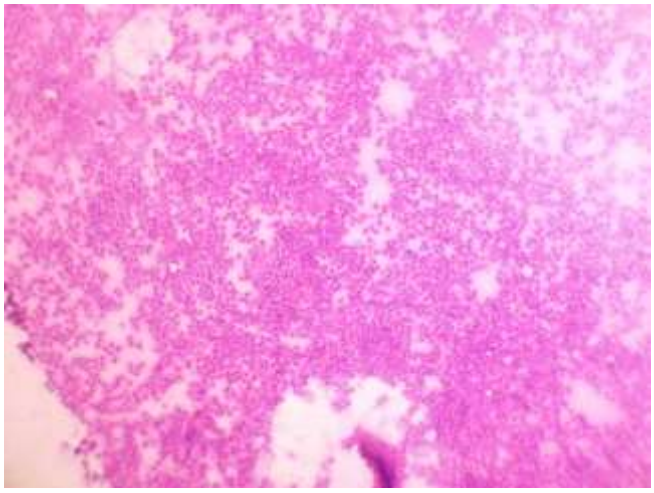


Fig. 1. A pronounced leukocyte reaction in an impression smear from the wound surface in a case of phlegmon. Conventional therapy, Patient E.N., born 1966. Day 1-2. Hematoxylin and eosin stain. Magnification x100.

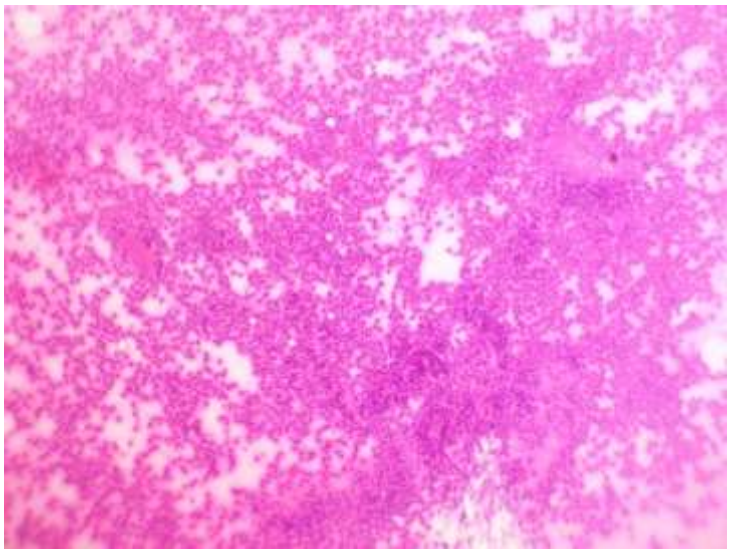
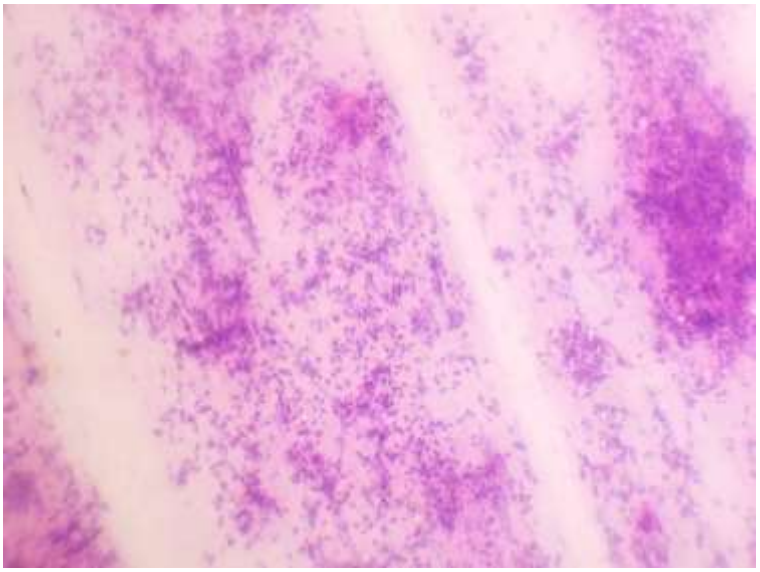


Fig. 2. Pronounced inflammatory infiltration of neutrophilic leukocytes and mucous masses. Traditional treatment. Patient G.M., born in 1991. Group II, days 3-4. Hematoxylin and eosin stain. Magnification: Obj. x40.



AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE
ISSN: 2996-5101 (online) | ResearchBib (IF) = 10.81 IMPACT FACTOR
Volume-4| Issue-5| 2026 Published: |30-05-2026

Fig. 3. Neutrophilic infiltration with an admixture of mononuclear cells in a cytogram. Traditional therapy, A III. Days 6-7. E.N., born 1966, March. Hematoxylin and eosin stain. Magnification: Obj. x4.0.

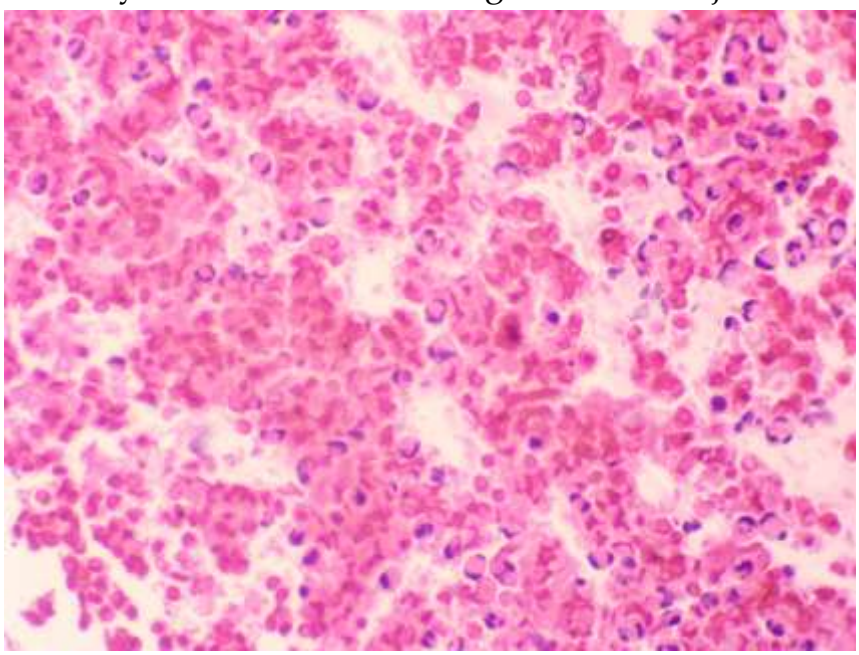


Fig. 4. The smear contains numerous erythrocytes with a few scattered leukocytes. Experimental group B II. Day 3. Patient Zh.Zh., born 1999. Stain: Hematoxylin and eosin (H&E). Magnification: 400x.

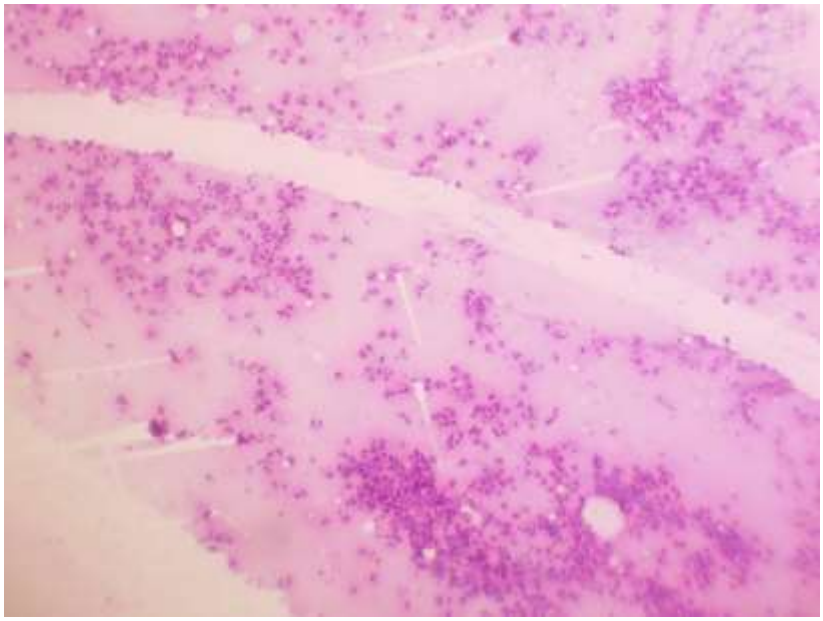


Figure 5. A minor focal accumulation of neutrophilic leukocytes with an admixture of mucus in a smear from the wound surface on days 6-7 (3rd experimental group). Stain: Hematoxylin and eosin. Magnification: 40x.

After repeated daily rinsing of the wound with the "Probiomics" probiotic solution, a significant decrease in purulent exudate, necrotic tissue sloughing, and erythrocyte accumulation was observed by the third day. In contrast, patients in the

control group undergoing traditional therapy exhibited a similar cytological picture that persisted until days 5-6.

Conclusion. Thus, local treatment using the proposed method with the "Probiomics" probiotic solution alongside traditional methods is highly effective and accessible for surgical practice. This is a more advanced treatment method that helps to clear wounds of the purulent-necrotic process and initiate regenerative processes in a short period of time. The results of the cytological study, comparing traditional treatment with the use of the probiotic, demonstrate the effectiveness of the proposed methodology and the potential for its wide application not only in dental but also in general surgical practice.

REFERENCES:

1. Диагностика и лечение флегмон челюстно-лицевой области, пути ее оптимизации / Т.Э. Доржиев, В.Е. Хитрихеев, В.П. Саганов [и др.] // Вестник Бурятского государственного университета. – 2015. – № 12. – С. 174–178.
2. Исмаилов, Г.М. Результаты лечения инфекции в области хирургического вмешательства методом фотодинамической терапии /Г.М. Исмаилов, Е.К. Словоходов, В.И. Ярема [и др.] // Эндоскопическая хирургия. – 2016. – Т. 22. – № 3. – С. 28–36.
3. Манойло, М.Н. Структурные особенности гнойно-воспалительных заболеваний челюстно-лицевой области у жителей Ханты-Мансийского автономного округа / М.Н. Манойло, В.В. Дарвин // Практическая медицина. – 2018. – Т. 16, № 8. – С. 117–120.
4. Абдуллаев Ш. Ю., Шомуродов К. Э. Использование низкочастотного ультразвука и актовегина в лечении одонтогенной флегмоны челюстно-лицевой области //Врач-аспирант. – 2011. – Т. 46. – №. 3.3. – С. 454-459
5. Шомуродов К. Э. Особенности баланса цитокинов в десневой жидкости при одонтогенной флегмоне челюстно-лицевой области //Врач-аспирант. – 2010. – Т. 42. – №. 5.1. – С. 187-192.
6. Шаева Р., Шомуродов К. Пути оптимизации комплексного лечения гнойно воспалительных заболеваний челюстно-лицевой области (обзор литературы) //Журнал стоматологии и краниофациальных исследований. – 2021. – Т. 2. – №. 2. – С. 13-17.
7. Шомуродов К. Э., Мирхусанова Р. С., Шаева Р. Г. Ошибки в диагностике острых воспалительных заболеваний периапикальных тканей в

догоспитальном периоде //Стоматология-наука и практика, перспективы развития. – 2021. – С. 247-249.

8. Воробьев А.А. Изучение чувствительности микробов к лекарственным препаратам ЖМЭИ, 2005, №3, с. 25-29.

9. Шомуродов К.Э., Набиев Р.Х. Изучение чувствительности микробов полости рта к лекарственным препаратам в условиях in vitro //Журнал Медицина и инновации. – 2025. – №. 2(18). – С. 211-218.

10. Набиев Р.Х., Мусаев Ш.Ш. Влияние озона на показатели эндогенной интоксикации в динамике комплексного лечения больных с одонтогенными флегмонами. Интегративная стоматология и челюстно-лицевая хирургия. 2024;3(3):181–186. https://doi.org/10.57231/j.idmfs.2024.3.3.024

11. Набиев Р.Х., Шомуродов К.Э., Буриев Н.З. Комплексный подход к лечению гнойно-воспалительных заболеваний челюстно-лицевой области в сочетании с метаболическим синдромом. Интегративная стоматология и челюстно-лицевая хирургия. 2023;2(3):125–133. https://doi.org/10.57231/j.idmfs.2023.2.3.017

12. Shomurodov K. E. Peculiarities of Clinic and Diagnostics of Phlegmon of the Oral Floor //Central Asian Journal of Medical and Natural Science. – 2023. – Т. 4. – №. 3. – С. 388-391.

13. Shomurodov K. E., Nabiyev R. H., Musaev S. S. СРАВНИТЕЛЬНАЯ ЭФФЕКТИВНОСТЬ МЕСТНОГО ПРИМЕНЕНИЯ РАСТВОРА ПРОБИОТИКА 4ПРОБИОМИКС5 И ТРАДИЦИОННОЙ АНТИСЕПТИЧЕСКОЙ ТЕРАПИИ В ЛЕЧЕНИИ ГНОЙНО: ВОСПАЛИТЕЛЬНЫХ ЗАБОЛЕВАНИЙ ЧЕЛЮСТНО: ЛИЦЕВОЙ ОБЛАСТИ //Eurasian Journal of Otorhinolaryngology-Head and Neck Surgery. – 2025. – Т. 4. – С. 58-64.

14. Шомуродов К.Э., Набиев Р.Х. ИЗУЧЕНИЕ ЧУВСТВИТЕЛЬНОСТИ МИКРОБОВ ПОЛОСТИ РТА К ЛЕКАРСТВЕННЫМ ПРЕПАРАТАМ В УСЛОВИЯХ IN VITRO! // Медицина и инновация. 2(18) июнь 2025. С.177-179

15. Шомуродов К.Э., Рейимназарова Г.Ж., Набиев Р.Х. Сравнтиельная цитологическая характеристика эффективности местного лечения одонтогенных флегмон челюстно - лицевой области в сравнении с традиционным лечением и применением Пробиотика. // Журнал Стоматологии и каниофацалных исследование. том 6, номер 3. С.75-78

16. Shomurodov K.E., Nabiyev R.H., Musaev Sh.Sh. APPLICATION OF PROBIOTIC SOLUTION IN THE TREATMENT OF PURULENT INFLAMMATORY DISEASES OF THE MAXILLOFACIAL REGION //

International bulletin of medical sciences and clinical research. Volume 5, Issue 12, December. P.180-186

17. Шомуродов К.Э., Набиев Р.Х.Современние аспекти этиологи и патогенеза флегмон дна полости рта // Перспективиы и инновации в челюстно лицевой хирургии. Решение молодых ученых. 10 февраль 2023 г., с. 58-61