ORIGINAL ARTICLE

INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE

ISSN: 2692-5206, Impact Factor: 12,23
American Academic publishers, volume 05, issue 11, 2025

Journal: https://www.academicpublishers.org/journals/index.php/ijai

STUDY OF MICROFLORA IN CHRONIC PURULENT RHINOSINUSITIS

Kholov Husen Negmurodovich
Bukhara State Medical Institute
xolov . husen @ bsmi . uz

Annotation
Chronic purulent sinusitis is a long-term inflammatory process in the air-permeable, clear cavities of the face, the main symptom of which is the formation of purulent exudate and a prolonged inflammatory reaction. Rhinoscopy, computed tomography, and microbiological analysis play an important role in diagnosis. In most cases, pathogens such as Staphylococcus aureus, Streptococcus pneumoniae, and Haemophilus influenzae are detected. Treatment is comprehensive and includes antibiotic therapy, restoration of mucociliary clearance, and surgical drainage with antiseptics.
Key words: Chronic purulent sinusitis, inflammation, bacteria, treatment

Relevance of the problem. Rhinosinusitis (RS) is one of the most common diseases of the upper respiratory tract, affecting one in eight patients per year among the adult population[2].
The development of inflammatory diseases of the nose and paranasal sinuses (NPS) occurs as a result of the weakening of the body's immune system, regardless of the nature of the factor causing it [1,5].
The important role of altered immunological reactivity in the pathogenesis of various forms of MS is currently recognized. Clinical manifestations of MS have recently been changing. Classic signs of sinusitis are not always obvious, due to changes in pathogenic microflora, environmental factors, the impact of uncontrolled drug use, and changes in immune status [7]. New objective methods for diagnosing MS and determining disease severity must be developed. Disease severity must be predicted to determine the extent of medical care [3,6,8].
Therefore, studying the clinical and immunological characteristics of patients and their changes in MS appears promising. According to the literature, there are currently no methods for diagnosing MS based on the analysis of the patient's immune status. The search for and improvement of such methods for diagnosing, preventing, and treating MS is a pressing issue in otolaryngology [4, 5, 9, 10].
The aim of the study was to evaluate the characteristics of the bacteriological analysis of chronic purulent rhinosinusitis.

Study materials and methods . This study was conducted on 186 patients diagnosed with chronic sinusitis, treated in the ENT department of the Bukhara Regional Multidisciplinary Medical Center. The duration of the disease varied from 6 months to 15 years, based on the patients' medical histories. All patients received conservative treatment.
186 patients participating in the scientific studies were aged from 25 to 75 years and were divided into 2 groups: the main group n=70 and the control group n=44. Of these, in the main group there were n=16 women (53.3%), n=60 men (71.4%), and in the control group there were n=14 women

ORIGINAL ARTICLE

INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE

ISSN: 2692-5206, Impact Factor: 12,23

American Academic publishers, volume 05, issue 11, 2025

Journal: https://www.academicpublishers.org/journals/index.php/ijai

(46.6%), n=24 men (28.6%). As can be seen from the above, the incidence of chronic sinusitis in men is 2.5 times more often than in women. This indicator increased proportionally with age.

To study the nature of the disease, 186 patients under observation were divided into 3 subgroups depending on age:

Subgroup 1 consisted of 28 (24.5%) patients aged 25 to 45 years, subgroup 2 consisted of 52 (45.6%) patients aged 45 to 60 years, and subgroup 3 consisted of 34 (29.8%) patients aged 60 to 75 years.

Men constituted 69.8% of those examined, and women 30.2%. Notably, in all age groups studied, regardless of gender, the number of men outnumbered the total number of patients.

This pattern is very difficult to explain, as it is linked to biological sex characteristics of the human body, which are not yet fully understood. Moreover, they comprise more than half of the patients examined—45.6%—between 45 and 60 years of age (Fig. 1). It should be noted that this can be explained by the anatomical, physiological, pathological, and local and general characteristics of the body, characteristic of the patients examined.

Results. The results of bacteriological examination are shown in 186 patients with chronic inflammatory processes of the paranasal sinuses, including 84 patients with chronic purulent inflammation (group I), 66 patients with exacerbation of the chronic inflammatory process (group II), 27 patients with exacerbation and relapse of chronic purulent rhinosinusitis (group III) and 9 patients with chronic purulent odontogenic sinusitis (group IV).

The results of bacteriological studies of patients with chronic purulent rhinosinusitis in these groups are presented in Figure 1.

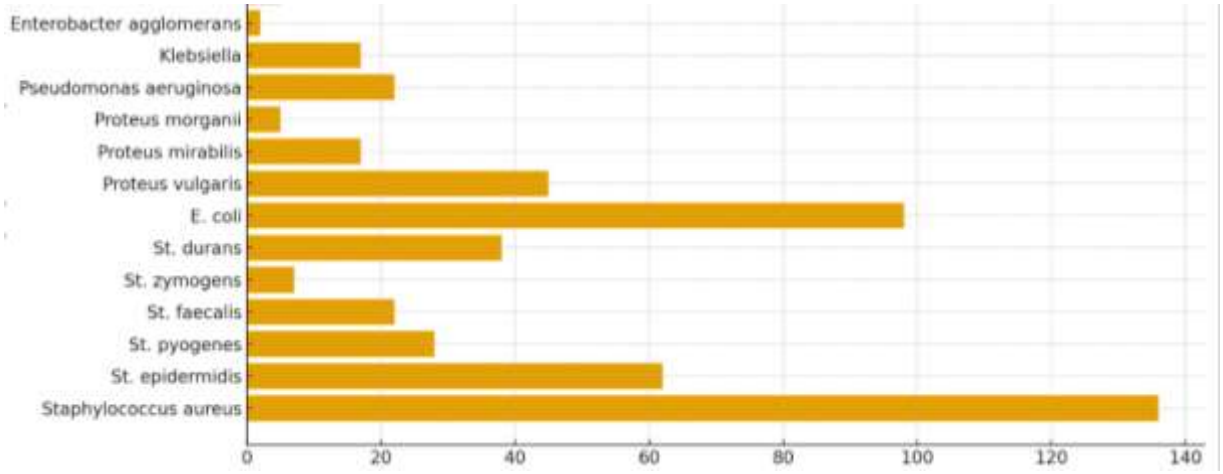

Fig 1. Results of bacteriological studies of patients with chronic purulent rhinosinusitis

It should be noted that in cases of pansinusitis and hemisinusitis, the microflora of the affected paranasal sinuses in the same patient was, as a rule, identical and identical in relation to antibacterial drugs, and also had the same features in the processes of toxin formation and in terms of pathogenicity.

Bacteriological studies of paranasal sinus secretions showed that 45 patients (24.86%) had monoculture of non-clostridial anaerobic infection in sinus secretions, i.e. aerobic flora in monoculture was detected in 38 patients (21.0%), in combination with purulent aerobes and intestinal flora isolated in anaerobes - in 98 patients (54.14%). The proportion of non-clostridial anaerobic infection during chronic purulent rhinosinusitis exceeded 4%. It should be noted that in

ORIGINAL ARTICLE
INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE
ISSN: 2692-5206, Impact Factor: 12,23
American Academic publishers, volume 05, issue 11, 2025
Journal: https://www.academicpublishers.org/journals/index.php/ijai

patients with exacerbation of chronic purulent sinusitis, monoflora prevails (75.51%), while in patients with chronic purulent rhinosinusitis, on the contrary, an association of bacteria (72, 73%). The results of the analysis showed that among the aerobic bacteria in the secretions of the paranasal sinuses of patients of all groups, the “intestinal” flora resistant to pathogenic and antibacterial drugs was found in the form of a monoculture (60.53%) and in the form of an association of cultures (62.24%).

Purulent gram-positive cocci were less frequently isolated as monocultures (21.05%) and as mixed cultures (26.53%). Therefore, in chronic rhinosinusitis, especially in patients in groups I, III, and IV, the role of purulent cocci is significantly reduced.

The high survival rate in patients (37.04%) is noteworthy, and in group III (46.5%), E. coli and Pseudomonas aeruginosa were detected.

Apparently, the emergence of highly aggressive forms of aerobic infection, atypical for the respiratory tract, is associated with a weakening of the patient's overall resistance and immune system due to a prolonged, latent purulent-inflammatory process in the paranasal sinuses. This circumstance indicates a high risk of patients contracting so-called "hospital infections," which include microflora indirectly characteristic of the gastrointestinal tract, i.e., E. coli, pseudomonas, and protein infections. This is confirmed by the frequent culture of secretions in patients in Group III (46.5%), indicating that they had previously undergone multiple surgical interventions.

The second most common bacteria in culture were gram-positive enterococci, such as Str. zymogenes and Str. durans (25.0%), the role of which in the development of purulent diseases of the paranasal sinuses has not been covered in many studies.

It is likely that the appearance of intestinal streptococci in the paranasal sinuses as an etiological factor (in 12 patients with monoculture and in 22 patients with association) is associated with the development of chronic purulent, purulent-polypous rhinosinusitis and their complications of orbital inflammation, a sharp weakening of the immune system and a decrease in the overall resistance of the patient's body.

It is noteworthy that in 8 cases, less aggressive, opportunistic gram-negative bacteria—Klebsiella—were detected in paranasal sinus discharge . Their presence in microbial communities indicates a significant decline in the body's immune system. In this case, saprophytic bacteria transform into aggressive microorganisms. In fact, acquired infectious immunosuppression can also occur in these patients, as 7 of the 8 patients with chronic purulent rhinosinusitis had suffered from this condition for more than 10 years, so the development of "opportunistic infections," particularly Klebsiella, was less common in them.

Conclusion. Thus, to summarize this section, it should be noted that the pathogenic aerobic and anaerobic flora isolated from purulent foci of the paranasal sinuses is highly diverse in composition. The polymicrobial nature of the bacterial biocenosis of the paranasal sinuses in patients with chronic purulent rhinosinusitis, despite the presence of highly pathogenic aerobes and anaerobes, is sensitive only to certain antibacterial agents. Furthermore, the overall increase in resistance of the most well-studied microorganisms to the most well-known antibiotics has allowed the identification of more effective methods of antibacterial therapy.

References:

ORIGINAL ARTICLE

INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE

ISSN: 2692-5206, Impact Factor: 12,23

American Academic publishers, volume 05, issue 11, 2025

Journal: https://www.academicpublishers.org/journals/index.php/ijai

1. Bin Liu . Epidemiology of chronic rhinosinusitis , selected risk factors, comorbidities and economic burden. 2015. No. 6.-P. 1081-1091.

2.Douville L., Fitzgerald M. Manager of acute sinusitis //J.Fm. Acad. Nurse. Pract. -2005. - V.7, No.28. - P. 407-411.

Daniel P. R., Herlemann. Tobias Schuldt. Microbiome and Culture Based Analysis of Chronic Rhinosinusitis Compared to Healthy Sinus Mucosa. Kerstin Koeller-., 2020.No.2.-R.65.

4. Dana T. Badr., MD1, Jonathan M., Gaffin, MD Curr. Treatment options for pediatric rhinosinusitis . Allergy. 2016 Sep.-P.654.

5. Daniel P . R . Chronic sphenoid Rhinosinusitis : a management challenge. Journal of Asthma and Allergy November 2018.

6. Erkan M., Aslan T., Ozcan M. Bacteriology of antrum in adults with chronic maxillary sinusitis / [Laryngoscope. 2014. Vol .104, N 23 (Pt 1). - P.321-324.

7. Evans K.L. Diagnosis and treatment of sinusitis (see comments) // BMJ . - 2004. - V. 309, No. 2. - P. 1415-1422.

8. Frederik Acke . Pathophysiological and clinical aspects of chronic rhinosinusitis : current concepts. Scadding . 2018, No. 3.-P.108.

9. Furukawa C. T. The role of allergic sinusitis in children // J. Allergy Clin . Immunol . 2012. - Vol. 90, No. 23 (p. 2). - P. 515-517.

10. Ferguson B.J. Acute and chronic sinusitis. How to relieve symptoms and identify the cause // Postgrad . Med . 2015. Vol. 97, No. 25. P. 45-52.