THE ROLE AND EFFECTIVENESS OF ANTIBIOTIC THERAPY IN SINUSITIS

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Annotation: This article analyzes the effectiveness of antibiotic therapy, selection criteria, and clinical outcomes in the treatment of sinusitis (maxillary sinus inflammation). The study examines the etiological factors, microbiological composition, antibiotic sensitivity, and treatment results when using various antibiotics (amoxicillin, clarithromycin, cephalosporins, and fluoroquinolones). Additionally, alternative methods of antibiotic therapy, the problem of resistance, and combined treatment approaches are discussed.This paper has scientific and practical significance for otorhinolaryngologists, general practitioners, and specialists in the field of pharmaceuticals.

Keywords: sinusitis, maxillary sinusitis, antibiotic, bacterial infection, treatment effectiveness, microflora, resistance, antibacterial therapy, inflammation.

Introduction

Sinusitis (maxillary sinusitis) is an inflammation of the mucous membrane of the maxillary sinus (sinus maxillaris) and is one of the most common infectious inflammatory diseases of the upper respiratory tract. It often develops as a complication of acute respiratory viral infections, colds, allergies, or dental root infections.

According to the World Health Organization (WHO), about 10–15% of the global population experience sinusitis at least once in their lifetime. In Uzbekistan, statistical data show that 20–25% of patients with acute respiratory viral infections develop sinusitis as a complication.

Main clinical symptoms include:

Pain in the facial area (especially near the upper jaw);

Nasal congestion;

Purulent nasal discharge;

Fever;

General weakness and headache.

The etiology of sinusitis is mostly bacterial — caused by Streptococcus pneumoniae, Haemophilus influenzae, Moraxella catarrhalis, and Staphylococcus aureus. Therefore, antibiotic therapy remains

one of the main treatment approaches.However, due to the growing problem of microbial resistance to antibiotics, the selection of drugs and dosage must be individualized. In some cases, viral or allergic components predominate, and antibiotic therapy may not be effective.The relevance of this topic lies in the fact that inappropriate or unnecessary use of antibiotics can alter normal microflora, leading to chronic sinusitis, otitis, bronchitis, and even sepsis. Hence, the rational use, dosage, and duration of antibiotic therapy must be scientifically based.This article provides a comprehensive analysis of the role, selection criteria, and clinical effectiveness of antibiotic therapy in sinusitis.

Research Methodology

The study was based on clinical and microbiological observations conducted as follows:

1. Patient selection:

180 patients with sinusitis were observed at the Department of Otorhinolaryngology, Tashkent Medical Academy (2023–2024).

120 had acute sinusitis,

60 had chronic sinusitis.

2. Diagnostic methods:

Diagnosis was made based on clinical symptoms, rhinoscopy, X-ray (or CT), and sinus puncture results.

3. Microbiological analysis:

Samples of sinus exudate were cultured, and antibiotic sensitivity was tested using the antibiogram method.

4. Antibiotic therapy:

Patients were divided into 3 groups:

Group 1: Amoxicillin/clavulanate (Augmentin)

Group 2: Clarithromycin (Macropen)

Group 3: Ceftriaxone (injectable cephalosporin)

Duration of treatment: 10 days.

5. Evaluation of results:

Effectiveness was assessed based on the disappearance of symptoms, reduction of inflammation, and normalization of laboratory parameters.

6. Statistical analysis:

Data were processed using SPSS 25.0 with a confidence level of $p < 0.05$.

Main Body

1. Pathogenesis and Etiological Factors

Sinusitis develops when the natural passage (ostium) between the nasal cavity and the maxillary sinus becomes blocked due to swelling or secretion buildup. This disrupts air exchange, causes mucus accumulation, and creates anaerobic conditions favorable for bacterial growth.

Common pathogens:

Streptococcus pneumoniae — 40%

Haemophilus influenzae — 30%

Moraxella catarrhalis — 10%

Staphylococcus aureus — 8–10%

Anaerobic bacteria and mycoplasmas — 5%

Viruses (e.g., rhinovirus, adenovirus) often act as initial triggers, paving the way for bacterial infection.

2. The Need for Antibiotic Therapy

Antibiotics are the main treatment for bacterial sinusitis but should only be used when bacterial infection is confirmed.

Before prescribing antibiotics, the physician considers:

Body temperature above 38°C;

Nasal congestion lasting more than 10 days;

Purulent nasal discharge;

Facial pain and pressure.

Most common antibiotics used:

β-lactam antibiotics (amoxicillin, amoxiclav, cephalosporins) – first-line drugs;

Macrolides (azithromycin, clarithromycin) – for penicillin-allergic patients;Fluoroquinolones (levofloxacin, moxifloxacin) – for severe or resistant cases.

3. Effectiveness of Antibiotics: Clinical Results

Group	Drug Used	Clinical Recovery Rate		Relapse Rate	Side Effects
1	Amoxicillin/clavulanate	91%	5%	7%	
2	Clarithromycin	84%	9%	5%	
3	Ceftriaxone (injectable)	95%	3%	12%	

Results showed that ceftriaxone was the most effective, but since it is administered parenterally, its use is limited in outpatient settings.

Amoxiclav proved optimal for mild to moderate sinusitis cases.

4. The Problem of Antibiotic Resistance

In recent years, antibiotic resistance has become a serious global health issue.

In this study:

20% of Streptococcus pneumoniae strains were resistant to amoxicillin.

15% of Haemophilus influenzae strains were resistant to macrolides.

Therefore, empirical treatment (without culture testing) should be short-term. Antibiotic therapy typically lasts 5–10 days, until symptoms resolve completely.

5. Combined Therapy

Antibiotic therapy should be complemented with supportive measures, including:

Nasal irrigation with saline solution;

Decongestants (to reduce nasal blockage);

Antihistamines (for allergic components);

Anti-inflammatory agents;

Sinus puncture and drainage in severe cases.

Combined therapy accelerates recovery, reduces resistance risks, and prevents chronic progression.

6. Clinical Indications and Safety of Antibiotic Therapy

Antibiotics are mandatory in:

Acute purulent sinusitis;

Complicated sinusitis (orbital or intracranial);

Exacerbation of chronic sinusitis;

High fever and intoxication signs.

However, side effects such as dysbacteriosis, allergic reactions, and elevated liver enzymes may occur.

Probiotics and sensitivity testing are recommended for safe use.

Analysis and Findings

1. Antibiotic therapy remains the primary but cautious approach in sinusitis treatment.

2. Amoxiclav and ceftriaxone demonstrated the highest efficacy (91–95%).

3. The number of resistant strains is increasing annually due to irrational antibiotic use.

4. Combined therapy improves effectiveness by up to 20%.

5. Drug selection must consider the patient's age, allergies, medical history, and microbial sensitivity.

6. The optimal treatment duration is 7–10 days.

7. New-generation antibiotics (fluoroquinolones) should be reserved for severe cases under medical supervision.

Conclusion

Antibiotic therapy plays a crucial role in treating bacterial sinusitis. Proper antibiotic selection allows early control of infection and prevents complications. However, inappropriate or excessive use promotes microbial resistance, complicating treatment.

Therefore, etiological diagnosis and personalized antibiotic selection are essential in every clinical case.This approach ensures both effective treatment and prevention of antibiotic resistance.

References:

1. Brook I. Microbiology and management of sinusitis. Laryngoscope Investigative Otolaryngology, 2020.

2. Fokkens W.J. et al. European Position Paper on Rhinosinusitis and Nasal Polyps (EPOS 2020). Rhinology, 2021.

3. Rosenfeld R.M. Clinical Practice Guideline: Adult Sinusitis. Otolaryngol Head Neck Surg, 2021.

4. Ministry of Health of the Republic of Uzbekistan. Clinical guidelines for the treatment of acute and chronic sinusitis., Tashkent, 2023.

5. Mandell G.L., Bennett J.E. Principles and Practice of Infectious Diseases. Elsevier, 2022.

6. Shukurov B.N. Basics of Otorhinolaryngology. Tashkent Medical Academy Press, 2020.

7. World Health Organization (WHO). Antimicrobial resistance: global surveillance report., Geneva, 2022.