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# RESULTS OF MICROBIOLOGICAL STUDY OF PATIENTS WITH CHRONIC INFLAMMATORY DISEASES OF THE LARYNX

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## ABOUT ARTICLE

**Key words:** mucous membrane, mucociliary transport, immunobiological resistance of the organism.

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**Abstract:** Violation of the integrity of the main barrier of protection - the mucous membrane - leads to the development of its inflammation. Thus, at the moment it is quite convincingly established that fungi can be, and are, the main cause of inflammation of the mucous membrane of the upper respiratory tract. This thesis does not remove the importance of viral and bacterial infection as the cause of inflammation. Any infectious agent encounters a powerful obstacle in the form of normal mucociliary transport. As long as mucociliary transport is functioning normally, the inflammatory agent has no opportunity to come into contact with cell receptors and cause disease. In this regard, any treatment must take into account the effect of the method or drug on mucociliary transport. Agents that damage mucociliary transport should not be used, and surgical methods should minimally damage the mucosa.

# ҲИҚИЛДОҚ СУРУНКАЛИ ЯЛЛИҒЛАНИШ КАСАЛЛИКЛАРИ БЎЛГАН БЕМОРЛАРДА МИКРОБИОЛОГИК ТАҲЛИЛ НАТИЖАЛАРИ

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## МАҚОЛА ҲАҚИДА

**Калит сўзлар:** шиллиқ қават, мукоцилиар транспорт, организм иммунобиологик резистентлиги.

**Аннотация.** Ҳимоянинг асосий тўсиғи - шиллиқ қаватнинг яхлитлигини бузиш унинг яллиғланишининг ривожланишига олиб келади. Шундай қилиб, ҳозирги вақтда замбуруғлар юқори нафас йўлларининг

шиллиқ қаватининг яллиғланишининг асосий сабаби бўлиши ва бўлиши мумкинлиги ишончли тарзда аниқланган. Ушбу мулоҳазалар вирусли ва бактериал инфекциянинг яллиғланиш сабаби сифатида аҳамиятини олиб ташламайди. Ҳар қандай юқумли агент оддий мукоцилиар транспорт шаклида кучли тўсиқга дуч келади. Шиллиқ қаватли транспорт нормал ҳолатда, яллиғланиш агенти ҳужайра рецепторлари билан алоқа қилиш ва касалликни келтириб чиқариш имкониятига эга емас. Шу муносабат билан ҳар қандай даволаш усули ёки препаратнинг мукоцилиар транспортга таъсирини ҳисобга олиш керак. Мукоцилиар транспортга зарар етказадиган воситалардан фойдаланмаслик керак, жарроҳлик усуллари эса шиллиқ қаватга минимал зарар етказиши керак.

# РЕЗУЛЬТАТЫ МИКРОБИОЛОГИЧЕСКОГО ИССЛЕДОВАНИЯ БОЛЬНЫХ ХРОНИЧЕСКИМИ ВОСПАЛИТЕЛЬНЫМИ ЗАБОЛЕВАНИЯМИ ГОРТАНИ

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## О СТАТЬЕ

**Ключевые слова:** слизистая оболочка, мукоцилиарный транспорт, иммунобиологический резистентность организма.

**Аннотация:** Нарушение целостности основного барьера защиты – слизистой оболочки – ведет к развитию ее воспаления. Таким образом, на настоящий момент достаточно убедительно установлено, что грибы могут быть, и являются основной причиной воспаления слизистой оболочки верхних дыхательных путей. Этот тезис не снимает значения вирусной и бактериальной инфекции как причины воспаления. Любой инфекционный агент встречает мощное препятствие в виде нормального мукоцилиарного транспорта. До тех пор, пока нормально функционирует мукоцилиарный транспорт, у возбудителя воспаления нет возможности вступить в контакт с рецепторами клеток и вызвать заболевание. В связи с этим, любое лечение должно учитывать влияние метода или лекарственного вещества на мукоцилиарный транспорт. Не следует применять средства, повреждающие мукоцилиарный транспорт, а хирургические методы должны в минимальном степени повреждать слизистую оболочку.

## INTRODUCTION

The growth of nosocomial infections, noted in recent decades, is due not only to a decrease in the immunobiological resistance of the body, but also to a change in the biological properties of microorganisms - pathogens. In the structure of nosocomial infections, 85% are purulent-inflammatory diseases and only 15% are infections (salmonellosis, escherichiosis, viral hepatitis) [1-4,12]. Purulent-septic complications can affect up to 35% of surgical patients, on average they occur in 15.7% of patients in general surgery departments. A correlation has been noted between the duration of anesthesia during surgery and the incidence of postoperative infection [8-11,13,14].

The occurrence of hospital infections in patients with diseases of the larynx is often associated with various diagnostic and therapeutic manipulations on this organ [5-7]. During intubation and tracheotomy, such complications are observed in 18.7% of patients. The frequency of nosocomial infections in intensive care units is higher than in others and reaches 27% [2,15-17].

## THE MAIN RESULTS AND FINDINGS

It is known that bacterial infection of the upper and lower respiratory tract to a large extent determines the duration of treatment of the patient, significantly affect the results of reconstructive operations. In this regard, we studied the microbial biocenosis of the respiratory tract in patients with chronic inflammatory diseases of the larynx in two studies.

In the first, the microbial composition of the mucous membranes of the larynx, trachea, bronchi, as well as the skin-tracheal canal of the tracheostomy was studied. The study of flora and analysis of bacteriological results was carried out according to nosological and etiological groups of patients. In addition, we studied the microflora of the nose and nasopharynx in patients with chronic inflammatory diseases of the larynx at different stages of the course of the pathological process, which was compared with the results of the underlying sections of the respiratory tract and was aimed at identifying mutual infection.

Group 1 - stenosis, due to cicatricial-paralytic narrowing, burns and non-negotiable etiology

Group 2 - stenosis due to resuscitation (intubation and trachestomy)

Group 3 - stenosis due to injuries of the larynx (chondroperichondritis of the larynx)

Of the total number of our patients, a clinically pronounced inflammatory process in the larynx was observed in 97 cases (77.6%) and was accompanied by the underlying disease of the hollow organs of the neck.

The results of microbiological studies conducted in 83 patients under aerobic conditions are shown in table. 1.

As can be seen from the data in this table, pyogenic cocci (types of staphylococcus and streptococcus) were most often found in the respiratory tract, the share of which was 40.7%. However,

in various etiological groups, the frequency of inoculation of pyogenic cocci varied from 32% (in group 2) to 50.0% (in group 1).

Approximately comparable in terms of seeding frequency were various types of aerobic gram-negative flora (E. coli, Pseudomonas, Proteus), the average share of which was 41.4%. Attention is drawn to the high frequency of gram-negative flora (especially pseudomonas infection) inoculation in patients with consequences of resuscitation complications (30.5%).

Table 1

Results of the study of the flora of the larynx, tracheostomy and bronchi under aerobic conditions.

| Nosological group and number of patients<br>Type of aerobic flora | I ( 23 )<br>A<br>B | II (42 )<br>A<br>B | III ( 18 )<br>A<br>B | Total ( 83 )<br>A<br>B |
|---|---|---|---|---|
| St. _ a ureus | 10<br>27.7 _ | 13<br>18.0 | 8<br>21.6 | 31<br>21.4 |
| St. _ and lbicans | 3<br>8.33 | 8<br>11.1 | 7<br>18.9 | 18<br>1 2, 4 |
| Str. viridans | 5<br>13.9 | 1<br>1, 4 | 3<br>8.1 | 9<br>6.2 |
| Str. haemolyticus | - | 1<br>1.4 | - | 1<br>0.7 |
| Enterococcus zymogenes | - | 5<br>6.8 | 2<br>5.4 | 7<br>4.8 |
| Enterococcus durans | 2<br>5.6 | 3<br>4, 2 | 2<br>5.4 | 7<br>4.8 |
| Klebsiella pneumoniae | - | 10<br>13.9 | 9<br>24.4 | 19<br>13.1 |
| E. coli | 3<br>8.33 | 4<br>5.6 | - | 7<br>4.8 |
| Ps. aeroginosa | 7<br>19.4 | 22<br>30.6 | 5<br>13.5 | 34<br>23.4 |
| Pr mirabilis | 3<br>8.33 | 3<br>4.2 | - | 6<br>4.2 |
| Pr. vulgaris | 3<br>8.33 | 2<br>2.8 | 1<br>2.7 | 6<br>4.2 |
| Total | 36<br>100 | 72<br>100 | 37<br>100 | 145<br>100 |

A - number of strains

B -% of the number in this group

Group 1 - stenosis, due to cicatricial-paralytic narrowing, burns and non-existent etiology - 23

Group 2 - stenosis due to resuscitation (intubation and trachestomy) -42

Group 3 - stenosis due to injuries of the larynx (chondroperichondritis of the larynx) -18

Table 2

The results of the study of the flora of the larynx, tracheostomy and bronchi under anaerobic conditions.

| Nosological group and number of patients<br>Type of anaerobic flora | I ( 22 )<br>A<br>B | III (40)<br>A<br>B | IV (18)<br>A<br>B | Total ( 80 )<br>A<br>B |
|---|---|---|---|---|
| Bacteroides fragilis | 13<br>33.3 | 14<br>25.0 | 10<br>27.1 | 37<br>28.1 |
| Bact. Melaninogenicus | 10<br>25.7 | 10<br>17.9 | 14<br>37.8 | 34<br>25.8 |
| Fusobacterium spp. | 5<br>12.8 | eleven<br>19.6 | 7<br>18.9 | 23<br>17.4 |
| Peptacoccus | - | 5<br>8.9 | 1<br>2.7 | 6<br>4.5 |
| Peptastreptococcus | 1<br>2.6 | 1<br>1.8 | 3<br>8.1 | 5<br>3.8 |
| Veilonella | 6<br>15.4 | 7<br>12.5 | 2<br>5.4 | 15<br>11.4 |
| Eubacterium | 2<br>5.1 | 6<br>10.7 | - | 8<br>6.0 |
| Acidaminococcus | 2<br>5.1 | 2<br>3.6 | - | 4<br>3.0 |
| Total | 39<br>100 | 56<br>100 | 37<br>100 | 132<br>100 |

A - number of strains

B -% of the number in this group

Group 1 - stenosis, due to cicatricial-paralytic narrowing, burns and non-existent etiology - 22

Group 2 - stenosis due to resuscitation (intubation and trachestomy) -40

Group 3 - stenosis due to injuries of the larynx (chondroperichondritis of the larynx) -18

Apparently, the appearance of these very aggressive types of pathogenic flora, which are not characteristic of the respiratory tract, is associated with a weakening of the overall resistance and immune forces of the body due to the underlying disease.

This circumstance indirectly indicates a high risk of infection of these patients with pathogens of nosocomial infection, which in particular includes wound echirichiosis, as well as Pseudomonas and Proteus infections. Attention is drawn to the fact that in patients of groups 2 and 3 there were relatively little aggressive, considered opportunistically pathogenic, gram-negative capsular bacteria of the Klebsiella genus (13.9% of strains in group 2 and 24.4% of strains in group 3).

The appearance of such bacteria in microbial associations indicates a significant decrease in the body's immune forces. In this case, such microorganisms can become very aggressive. The immunosuppressive state of patients in these groups is quite understandable, given that they underwent severe surgical interventions, massive transfusions of blood and protein preparations.

Thus, the microbial biocenosis of the larynx in patients is characterized by a variety of species composition, where the leading role is played by gram-positive pyogenic cocci and gram-negative highly pathogenic representatives of the genus Pseudomonas, Proteus, and also E. coli.

A total of 80 people were examined for the presence of anaerobic microorganisms in the respiratory tract (Table 2 ).

As can be seen from the indicators of the table, the dominant type of anaerobic microorganisms were bacteroids, which accounted for 53.8% of all strains obtained. Interestingly, the second and subsequent places in terms of frequency of inoculation from the respiratory tract were occupied by Fusobacteria (17.4%), Veillonella (11.3%) and Peptococci with Peptostreptococci (8.3%), respectively. A small percentage of strains (3%) were rare in the respiratory tract and relatively less pathogenic cocci of the genus Acidaminococcus.

Thus, anaerobic pathogens were found in pathological exudates in all 80 examined patients, which accounted for 64% of the total number of patients. Therefore, anaerobic infection in the upper respiratory tract cannot be considered a rare or incidental finding. On the contrary, the high frequency of inoculation of anaerobes from the inflammatory focus of the larynx, trachea, and bronchi allows us to consider these pathogens as a characteristic etiological factor in the inflammatory processes of the respiratory tract.

Such a diverse species composition of respiratory tract microorganisms, the presence of a little present, and sometimes absent in the normal pathogenic flora of the larynx of the trachea, as well as the fact that at the present stage of development of laryngology, an increasing number of scientists and clinicians tend to consider chronic stenosis of the larynx and trachea not as an isolated pathology of the laryngotracheal respiratory tract, but as a pathology of the respiratory tract in general, the state of the microflora of the nose and paranasal sinuses, as well as the nasopharynx in patients with chronic inflammatory diseases of the larynx, was studied.

Based on the foregoing, the goal was to comparatively study the quantitative and qualitative indicators of the microflora of the initial section of the respiratory tract in individuals with inflammatory diseases of the larynx and trachea.

However, the development of various pathological processes in the mucous membrane of the respiratory tract, as a rule, leads to a sharp increase in both quantitative and qualitative indicators of the microflora of a given biotope.

Of 72 patients aged 15 to 67 years with various inflammatory diseases of the larynx and trachea, as well as 21 volunteers (clinic staff and students), as a comparison group, who did not have any diseases and did not suffer from inflammatory diseases of the larynx and trachea, 3 groups.

- Group I consisted of healthy individuals in the amount of 21 people who did not have pathological manifestations in the respiratory tract.

- Group II of the examined patients consisted of 38 people suffering from chronic stenosis of the larynx and trachea with a relatively short duration of damage to the larynx (6-8 months).

- III group consisted of 34 patients with gross violations of the lumen of the larynx, which developed as a result of repeatedly performed reconstructive and restorative operations and the duration of damage to the larynx was more than 12-18 months.

The results of the conducted microbiological studies are given in Table. 3. The table shows that normally, in healthy individuals, the discharge of the mucous membrane of the nose and nasopharynx contained a fairly significant amount of different types of microbes. The number of anaerobic microorganisms significantly exceeded the number of aerobic ones. Among the studied anaerobic microbes, peptostreptococci were sown in the greatest amount, the number of which was Lg 3.30 ± 0.17 CFU/g, and the lowest sown inoculation was noted for bacteroids. Their number was Lg 1.15 ± 0.10 CFU/g.

Table 3

Characteristics of the microflora of the nasopharynx in patients with various pathomorphological variants of lesions of the larynx and trachea Lg M ± m cfu/ml

| **No.** | Groups of microbes | The number of microbes in 1 ml | | |
|---|---|---|---|---|
| | | norm | sick 2 groups | sick 3 groups |
| 1 | Total number of anaerobes | 4.30±0.10 | 3.47±0.13 | 4.90±0.13 |
| 2 | Bacteroids | 2.15±0.12 | 2.60±0.11 | 3.47±0.11 |
| 3 | Peptostreptococci | 3.15±0.21 | 2.30±0.12 | 2.15±0.9 |
| 4 | Clostridia | - | 1.00±0.09 | - |
| 5 | Fusobacteria | 1.30±0.11 | - | 1.15±0.01 |
| 6 | Peptococci | 2.00±0.12 | 2.15±0.11 | 2.47±0.11 |
| 7 | Total number of aerobes | 2.64±0.13 | 2.85±0.37 | 6.15±0.41 |
| 8 | Staphylococcus aureus | - | 2.15±0.11 | 1.47±0.01 |
| 9 | Staphylococcus saprophytic | 1.30±0.9 | 2.30±0.12 | - |
| 10 | Staphylococcus epidermidis | 2.47±0.11 | 2.47±0.11 | 3.30±0.9 |
| eleven | Group A Streptococcus | - | 3.15±0.14 | 3.15±0.11 |
| 12 | Streptococcus group D | 1.47±0.09 | - | 4.30±0.01 |
| 13 | Escherichia L.M. | - | - | 2.15±0.11 |
| 14 | Escherichia L.N. | - | 1.30±0.09 | 2.30±0.12 |
| 15 | Diphtheroids | 2.30±0.11 | 2.15±0.11 | 1.00±0.09 |
| 16 | Pseudomonas aeruginosa | - | - | 1.30±0.09 |
| 17 | Mushrooms | 1.00±0.09 | 1.30±0.09 | 1.47±0.01 |

Along with this, in the aerobic group of microorganisms, green streptococci ( Str. viridans), epidermal staphylococci and diphtheroids were sown most of all. Their number, as a rule, was the same and amounted to Lg 2.30±0.11 CFU/g. Among aerobic microorganisms, fungi and

saprophytic staphylococci had the lowest seeding rate. At the same time, the given indicators are corrected with the literature data.

However, as expected, with the development of pathological processes in the respiratory tract, pronounced dysbiotic changes occur in its flora, both in quantitative and qualitative terms.

So, as can be seen from Table. 3, in patients of group II, the total number of anaerobes was Lg 3.47±0.13. It was somewhat less than in healthy people and at the same time we see an increase in the number of bacteroids and peptococci by more than 2 times. However, the most significant changes occurred in the facultative group of microorganisms.

So, according to the data from the table, their total number prevailed over the number of anaerobes and amounted to Lg 4.85±0.37 CFU/g. The greatest inoculation was noted from staphylococci and streptococci. Of particular note is the fact of inoculation of microorganisms with a large set of pathogenicity factors, which include cultures of Staphylococcus aureus and pyogenic streptococci.

Apparently, the appearance of these aggressive strains indicates a decrease in the protective factors of organisms, and the otolaryngologist must take this circumstance into account. It should also be noted that microbes are sown in this biotope, the presence of which is not typical, in particular, an increase in intestinal pathology was observed.

The results of microbiological studies conducted in group III showed that in this group of patients, quantitative and qualitative changes in the microflora of the nasopharynx were even more pronounced. So, although the total number of anaerobes increased not so pronounced, the number of bacteroids was Lg 3.47±0.11 CFU/g, while the norm was Lg 2.15±0.12. The most significant changes in the microflora of the nasopharynx in these patients were noted in the facultative group of microbes. Thus, their total amount was Lg 6.15±0.41 CFU/g. These data are almost 3 times higher than the control figures. The most pronounced changes in the direction of increasing pathogenicity were noted in epidermal staphylococci and enterococci. It should be emphasized that in this group of patients, microorganisms that are not typical for this biotope began to be sown. These are Escherichia and Pseudomonas aeruginosa.

It is interesting to note that in this group of patients there was a significant increase in the number of microbes with a set of pathogenicity enzymes, to which we include strains of Staphylococcus aureus and pyogenic streptococcus. Apparently, it is these groups of microbes with increased aggressive properties that determine the clinical course of the disease, which otorhinolaryngologists should take into account when conducting medical manipulations.

Summarizing the presented material, it should be noted a gradual increase in pathogenicity factors in the above groups of patients. The above distribution of microorganisms in the

nasopharynx is quite understandable, given the provoking factors, among which it is logical to include the presence of one or another pathology in the underlying sections of the respiratory tube.

In patients of group II with chronic inflammatory diseases of the larynx, the fact of inoculation of microorganisms with a larger set of pathogenicity factors was noted than in the control first group. Apparently, the appearance of more aggressive strains in this pathology indicated a decrease in the local protective factors of the body.

The most pronounced consequences that caused an increase in pathogenicity were found in patients of group III, in whom microorganisms were sown that were atypical for the nasopharyngeal region. The presence of an extensive defect and mixed breathing, as well as a long period of damage to the larynx, become the cause of aggravating the disease and aggravating the patient's condition. Moreover, in a number of patients of the third group with obliteration of the larynx and trachea and, accordingly, the absence of breathing through the natural respiratory tract, there were more pronounced indicators of the acceleration of pathogenicity in the nasopharynx than in other patients of the same group.

We also found that when the tracheostomy area is contaminated with associations of microorganisms with the presence of fungal flora (mainly Candida ), as well as very aggressive types of microorganisms of the aerobic flora that are not characteristic of the respiratory tract ( Pseudomonas infection) the duration of treatment increased. In the catamnesis, we noted poor healing, as well as excessive growth of scar tissue, which led to a recurrence of the process in the larynx and trachea and became the reason for repeated treatment.

Thus, the microbiological study of the nasopharynx in patients with pathology of the larynx and trachea revealed a wide range of microorganisms with different indicators of pathogenicity factors that play an important role in the development and course of diseases of the upper respiratory tract.

When comparing the microbial composition of the larynx, tracheostomy, bronchi and nasopharynx with the clinical manifestations of the inflammatory process, we noted a certain correlation.

Attention was drawn to the fact that the spread of anaerobic bacteria into the underlying sections of the respiratory tract was clinically accompanied by the phenomena of diffuse bilateral purulent bronchitis, recurrent or sluggish focal pneumonia. The inflammatory process in the broncho-pulmonary system was characterized by a pronounced bronchorrhea with abundant secretion of viscous sputum with a putrid odor (which is pathognomic for anaerobic infection). The inflammatory process proceeded especially rapidly and severely in associations of bacteria of the Bacteroides and Pseudomonas groups (9 patients), as well as Fusobacterium and Proteus (5 patients). In these cases, against the background of focal and segmental pneumonia, patients had a broncho -obstructive syndrome with atelectasis, due to increased viscosity of

sputum, in which a large number of fibrin filaments were found. Under these conditions, we also observed a tendency to bleeding of the mucous membrane of the trachea and bronchi, which manifested itself in repeated episodes of hematoe.

The local inflammatory process in the larynx and tracheostomy depended both on the type of lesion of the larynx and on the microbial composition of the wound. The most violent exudative-infiltrative processes in the larynx and trachea occurred in group II patients with open penetrating wounds of the cervical respiratory tract. Severe disturbances in the microcirculation of extensive areas of the larynx, trachea and soft tissues of the neck, as well as violations of the integrity of the mucous membranes and skin of this area, contributed to the penetration of anaerobes into the environment of the surgical wound, which was unusual for them, which led to the manifestation of their aggressive pathogenic properties.

The active vital activity of anaerobes in the wound was characterized by specific clinical symptoms. So, for example, we did not observe the formation of large abscesses in the wound. The wound process was characterized by purulent imbibition of tissue, neck muscles, cartilage and perichondrium of the injured larynx. The tissues of the wound canal often had a dirty gray color and were flabby. When melanin-forming bacterioids were vegetated, muscle tissue and fiber acquired brown and even black color.

When gram-negative aerobic flora was detected in combination with anaerobes from wounds, a putrid, extremely unpleasant odor was felt, which was due to the formation of thiols and mercaptans due to the peculiarities of the metabolism of these bacteria.

In patients who underwent resuscitation (intubation and tracheotomy), the open penetrating wound, in fact, was a tracheostomy. Therefore, the contamination was also high.

Infiltrative phenomena were observed in the larynx, which were determined endoscopically. Signs of anaerobic infection were mainly manifested in the tracheostomy area (congestive hyperemia of the skin, persistent tissue infiltration, growth of granulations, dirty gray plaque in the wound channel, etc.)

It is interesting to note that the most popular and widely used antibiotics have very little activity against most aerobic and anaerobic pathogens.

cefota xim, ceftriaxone), which inhibited the growth of more than 80% of strains of gram-positive and gram-negative aerobes, had the highest activity.

Among antiaerobic drugs, attention is drawn to those that, having a narrow spectrum of action, showed very high activity against certain varieties of microflora. Thus, antibiotics from the group III generation of cephalosporins (cefobid, ceftriaxone) very actively prevented the growth of gram-negative aerobic flora and enterococcus (from 89.5% to 100% of individual strains).

The widely known, but rarely used drug tobramycin, as well as the recently synthesized fluoroquinolone (ofloxacin) were very active only among gram-positive representatives of aerobic bacteria (suppressed from 94.7% to 100% of strains of individual species) and had practically no effect on gram-negative microflora.

Of particular note is the extremely high activity of protected amoxicillin (Augmentin, Amoxiclav) against gram-positive aerobic cocci (sensitivity 97.9% - 100% of strains).

An analysis of the indicators in the tables leads to the conclusion that most antibiotics with high antiaerobic activity turned out to be very weak or completely ineffective antianaerobic drugs. The arsenal of drugs with antianaerobic properties turned out to be very small.

It should be noted the antibacterial chemotherapy drug metronidazole, which turned out to be active against highly pathogenic gram-negative anaerobes (bacteroids, fusobacteria), but not very effective against gram-positive anaerobic cocci (peptococci, peptostreptococci).

## CONCLUSION

Thus, to summarize this section, it should be noted that the pathogenic flora has a very diverse composition. Among the aerobic representatives, coccal flora was the most common. The anaerobic non- clostridial flora was mainly represented by highly pathogenic bacteroids and petostreptococci.

It follows from these data that in all cases the bacterial composition of the studied zones was polymicrobial and consisted of at least 1-2 aerobic and 1-2 anaerobic bacteria cultures.

The study of the sensitivity of bacteria to antibiotics showed that the spectra of action of various drugs often do not coincide with respect to all varieties of isolated bacterial structures.

At the same time, the most popular broad-spectrum antibiotics actually turned out to be inactive against the obtained strains of pathogenic microorganisms.

Consequently, the polymicrobial nature of bacterial biocenoses of the larynx, tracheostomy and bronchi, the presence of highly pathogenic non-clostridial anaerobes in them with special sensitivity only to certain drugs, as well as a general increase in the resistance of most well-studied bacteria to popular antibiotics - all this determined the search for more effective methods of antibacterial therapy for such sick.

## REFERENCES

1. Djuraev, J. A., Khasanov, U. S., Vohidov, U. N., & Sharipov, S. S. (2020). Results of Allergological and Immunological Research in Patients with Polipoid Rhinosinusitis. *Asian Journal of Immunology*, 34-40.

2. Botirov, A. J., Isroilov, R. I., Matkuliyev, K. H. M., SH, K. U. K., Akhundjanov, N. O., Djuraev, J. A.,... & Zokirova, Z. J. (2020). Clinical and morphological results of xenografts to use in myringoplasty. *The International Tinnitus Journal*, *24*(1), 1-6.

3. Khasanov, U. S., & Djuraev, J. A. (2020). MORPHOLOGICAL CHARACTERISTICS OF CHRONIC POLYPOUS RHINOSINUSITIS. *CUTTING EDGE-SCIENCE*, 30.

4. Djuraev, J. A., & Khasanov, U. S. (2021). Results of Frequency Analysis Distribution of Polymorphism Rs1800895 592c> A In Il10 Gene among Patients with Chronic Polypoid

Rhinosinusitis. *International Journal Of Medical Science And Clinical Research Studies*, *1*(6), 129-134.

5. Djuraev, J. A., Khasanov, U. S., & Vokhidov, U. N. (2018). The prevalence of chronic inflammatory diseases of the nose and paranasal sinuses in patients with myocarditis. *European Science Review*, (5-6), 147-149.

6. Djuraev, J. A., Khasanov, U. S., Botirov, A. J., & Shaumarov, A. Z. (2020). Results of an immunogistochemical study in patients with polipoid rhinosinusitis. *European Journal of Molecular & Clinical Medicine*, *7*(2), 2526-2541.

7. Shaumarov, A. Z., Shaikhova, H. E., Normurodov, B. K., Akhmedov, S. E., & Djuraev, J. A. (2021). Role of Hemostatic Agents in Simultaneous Surgical Interventions in the Nasal Cavity. *Journal of Experimental and Clinical Surgery*, *14*(2), 175-180.

8. UN, K. U. D. J. V., & Botirov, A. J. (2021). Frequency analysis results distribution of C589T rs2243250 polymorphism in IL4 gene among patients with chronic rhinosinusitis.

9. Nordjigitov, F. N., & Djuraev, J. A. (2021). RESULTS OF MORPHOLOGICAL STUDIES OF VARIOUS FORMS OF CHRONIC TONSILLITIS. *Central Asian Journal of Medicine*, *2021*(4), 125-132.

10. Khasanov, U. S., Djuraev, J. A., Vokhidov, U. N., Khujanov, S. K., Botirov, A. Z., & Shaumarov, A. Z. (2022). RESULTS OF FREQUENCY ANALYSIS DISTRIBUTION OF A1188C RS3212227 POLYMORPHISM IN THE IL 12B GENE AMONG PATIENTS WITH CHRONIC RHINOSINUSITIS POLYPOSIS. *Oriental Journal of Medicine and Pharmacology*, *2*(01), 104-115.

11. Khasanov, U. S., Djuraev, J. A., Vokhidov, U. N., & Botirov, A. J. Morphological Characteristics of the Cysts of the Maxillary Sinuses. In *International Scientific and Current Research Conferences*.

12. Khasanov, U. S., Abdullaev, U. P., & Djuraev, J. A. (2022). RESULTS OF AUDIOLOGICAL EXAMINATION IN ACUTE SENSORINEURAL HEARING LOSS OF VARIOUS GENESIS. *Oriental Journal of Medicine and Pharmacology*, *2*(01), 24-50.

13. Djuraev, J. A., Khasanov, U. S., Vokhidov, U. N., Botirov, A. J., Akhundjanov, N. A., Ergashev, U. M.,... & Shaumarov, A. Z. (2021). Distribution of Allel Variants and Genotypes of Il4, Il10, Il12b, Tlr2 Genes in the Group of Patients with CPRS. *Annals of the Romanian Society for Cell Biology*, 4466-4470.

14. Khasanov, U. S., Khaydarova, G. S., Rakhimjonova, G. A., & Djuraev, J. A. (2022). BOLALARDA EKSUDATİV OTITNI DAVOLASH USULI. *Oriental Journal of Medicine and Pharmacology*, *2*(1), 64-80.

15. Khasanov, U. S., Khayitov, O. R., & Djuraev, J. A. (2021). OF THE STATE OF HEARING AND CEREBRAL HEMODYNAMICS IN PATIENTS WITH DEVIATION OF THE NASAL SEPTUM. In *НАУКА, КУЛЬТУРА, ОБРАЗОВАНИЕ: АКТУАЛЬНЫЕ ВОПРОСЫ, ДОСТИЖЕНИЯ И ИННОВАЦИИ* (pp. 185-187).

16. Djuraev, J. A., & Makhsitaliev, M. I. Morphofunctional State of the Maxillary Sinus Mucosa in Patients After Endoscopic Infundibulotomy.

17. Khasanov, U. S., Khayitov, O. R., & Djuraev, J. A. On The Features of Changes In Hearing And Cerebral Hemodynamics In Patients With Nasal Obstruction Curvature.

18. Khasanov, U. S., Vokhidov, U. N., & Djuraev, J. A. (2018). State of the nasal cavity in chronic inflammatory diseases of the nose and paranasal sinuses in patients with myocarditis. *European science,(9 (41)).–2018*.