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Research Article

RESULTS OF MICROBIOLOGICAL STUDIES OF PATIENTS WITH CHRONIC INFLAMMATORY DISEASES OF THE LARRYN

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ABSTRACT

The increase in nosocomial infections observed in recent decades is due not only to a decrease in the immunobiological resistance of the body, but also to changes in the biological properties of microorganisms that cause diseases. In the structure of nosocomial infections, 85% are due to purulent- inflammatory diseases and only 15% to infections (salmonellosis, escherichiosis, viral hepatitis). 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 . The occurrence of hospital infections in patients with diseases of the larynx is often associated with various diagnostic and therapeutic manipulations on this organ. 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% .

KEYWORDS

Bacterial infection, reconstructive surgery, larynx.

INTRODUCTION

Chronic inflammatory diseases of the larynx (CILD) are a collective concept for a fairly large number of diseases with different etiologies. Nosological forms of laryngeal diseases are presented in a wide range - from functional disorders leading to respiratory failure, benign formations of the larynx to severe, long-term scar stenoses requiring complex reconstructive operations.

Pathomorphological assessment of this condition of the larynx is primarily associated with the presence of chronic inflammation of the mucous membrane and elements of the larynx, including the submucosal layer, as well as the muscles and cartilage of the larynx [7,9]. Most often, chronic inflammation of the larynx is localized in the area of the vocal cords, subvocal larynx with transition to the cervical trachea and is a secondary manifestation of the damaging factor.

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Despite the apparent differences associated with localization and etiology, all of these diseases have one common component, characterized by damage to the mucous membrane and elements of the larynx. The mucous membrane of the laryngotracheal respiratory tract reacts differently to the influence of one or another damaging factor and leads to the development of one of the pathologies [1-4,8]. When the vocal fold area is involved, this manifests itself as hypertrophic growth or atrophy. Damage to the underlying sections leads to melting of the cartilage of the larynx and trachea and contributes to the formation of scars [5,6]

In this regard, solving the problem of restoring the mucous membrane and elements of the larynx and trachea as a result of intervention, as well as options for preventing their damage, are a priority in the treatment of the above diseases.

To understand the processes of inflammation of the mucous membrane, it is necessary to know the physiology of the mucous membrane. In order to understand how, with what actions and with what medicinal substances to treat inflammation, it is necessary to know the mechanism of inflammation development.

Results.

It is known that bacterial infections of the upper and lower respiratory tract largely determine the duration of treatment for the patient and 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 tracheal-cutaneous 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 pathological process, which was compared with the results of the underlying parts of the respiratory tract and was aimed at identifying mutual infection.

Group 1 – stenosis, due to cicatricial-paralytic narrowing, burns and related etiology

Group 2 – stenosis due to resuscitation measures (intubation and trachestomy)

Group 3 – stenosis due to laryngeal injuries (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 accompanied 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 (species of staphylococcus and streptococcus) were most often found in the respiratory tract, the specific gravity of which was 40.7%. However, in different etiological groups , the frequency of inoculation of pyogenic cocci varied from 32% (in group 2) to 50.0% (in group 1).

Approximately comparable in seeding frequency were various types of aerobic gram-negative flora (Escherichia coli, pseudomonas, Proteus), whose share averaged 41.4%. Noteworthy is the high frequency of

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seeding of gram-negative flora (especially pseudomonas infection) in patients with consequences of resuscitation complications (30.5%).

Table 1

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

Nosological group and number of patients Type of aerobic flora	I (23) A B	II (42) A B	III (18) A B	Total (83) A B
St. _ and ureus	10 27.7 _	13 18.0	8 21.6	31 21.4
St. _ and lbicans	3 8.33	8 11.1	7 18.9	18 1 2 , 4
Str . viridans	5 13.9	1 1, 4	3 8.1	9 6.2
Str . haemolyticus	-	1 1.4	-	1 0.7
Enterococcus zymogenes	-	5 6.8	2 5.4	7 4.8
Enterococcus durans	2 5.6	3 4, 2	2 5.4	7 4.8
Klebsiella pneumoniae	-	10 13.9	9 24.4	19 13.1
E. coli	3 8.33	4 5.6	-	7 4.8

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Ps. aeroginosa	7 19.4	22 30.6	5 13.5	34 23.4
Pr mirabilis	3 8.33	3 4.2	-	6 4.2
Pr. vulgaris	3 8.33	2 2.8	1 2.7	6 4.2
Total	36 100	72 100	37 100	145 100

A - number of strains

B - % of the number in this group

Group 1 – stenosis, due to cicatricial-paralytic narrowing, burn and related etiology - 23

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

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

Table 2

Results of the study of laryngeal flora, tracheostomy and bronchi under anaerobic conditions.

Nosological group and number of patients Type of anerobic flora	I (22) A B	III (40) A B	IV (18) A B	Total (80) A B
Bacteroides fragilis	13 33.3	14 25.0	10 27.1	37 28.1
Bact. Melaninogenicus	10 25.7	10 17.9	14 37.8	34 25.8
Fusobacterium spp .	5	eleven	7	23

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	12.8	19.6	18.9	17.4
Peptacoccus	- -	5 8.9	1 2.7	6 4.5
Peptastreptococcus	1 2.6	1 1.8	3 8.1	5 3.8
Veilonella	6 15.4	7 12.5	2 5.4	15 11.4
Eubacterium	2 5.1	6 10.7	- -	8 6.0
Acidaminococcus	2 5.1	2 3.6	- -	4 3.0
Total	39 100	56 100	37 100	132 100

A - number of strains

B - % of the number in this group

Group 1 – stenosis, due to cicatricial-paralytic narrowing, burn and related etiology - 22

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

Group 3 - stenosis due to laryngeal injuries (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 general 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 eschirichiosis, as well as pseudomonas and proteus infections. Noteworthy is the fact that in patients of groups 2 and 3 there were relatively few aggressive gram-negative capsular bacteria of the genus Klebsiella, which are considered conditionally pathogenic (13.9% of strains in group 2 and 24.4% of strains in group 3).

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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 and massive transfusions of blood and protein drugs.

Thus, the microbial biocenosis of the larynx in patients is characterized by a diversity 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 , as well as 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 table, the dominant type of anaerobic microorganisms were bacteroides, which accounted for 53.8% of all obtained strains. It is interesting that the second and subsequent places in terms of frequency of inoculation from the respiratory tract were occupied, respectively, by Fusobacteria (17.4%), Veillonella (11.3%) and Peptococci with Peptostreptococci (8.3%). A small percentage of strains (3%) were cocci of the genus Acidaminococcus , which are rare in the respiratory tract and relatively less pathogenic .

Thus, anaerobic pathogens were found in pathological exudates in all 80 examined patients, which amounted to 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 inflammatory processes of the respiratory tract.

Based on the above, the goal was set of a comparative study of quantitative and qualitative indicators of the microflora of the initial part of the respiratory tract in people with inflammatory diseases of the larynx and trachea.

It is interesting to note that, despite the protective barriers of the mucous membrane of the respiratory tract, the so-called normal microflora is constantly present on it, which in the process of evolution has adapted to be in this biotope. Among these permanent inhabitants of the nasopharynx of healthy people, according to Strakir (1989), hemophils are found - 40-80%; pneumococci – 20-40%; viridans streptococci – 20-30%; neisseria, staphylococci, micrococci, etc. At the same time, according to Cnasro , Hevresa (1997), diphtheroids, white and sometimes aureus staphylococci, alpha and beta hemolytic streptococci, etc. were found in nasal mucus.

The results of a microbiological study 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. Thus, although the total number of anaerobes increased not so pronounced, the number of bacteroids was Lg 3.47 ± 0.11 CFU/g, with a norm of 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 number 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 especially emphasized that microorganisms that were not typical for this biotope began to be sown in this group of

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patients. 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 that have a set of pathogenicity enzymes, to which we include strains of Staphylococcus aureus and Streptococcus pyogenes. Apparently, it is these groups of microbes with increased aggressive properties that determine the clinical course of the disease, which otorhinolaryngologists must take into account when carrying out therapeutic manipulations.

Summarizing the presented material, it should be noted that there is a gradual increase in pathogenicity factors in the given groups of patients. The above distribution of microorganisms in the nasopharynx is quite understandable if we take into account provoking factors, which logically include the presence of a particular pathology in the underlying parts of the respiratory tube.

In patients of group II with the presence of chronic inflammatory diseases of the larynx, the fact of inoculation of microorganisms with a larger set of pathogenicity factors than in the control group 1 was noted. Apparently, the appearance of more aggressive strains in this pathology indicated a decrease in the local protective factors of the body.

Analysis of the table indicators leads to the opinion that most antibiotics with high antiaerobic activity turned out to be very weak or completely ineffective antianaerobic drugs. The arsenal of drugs with anti-anaerobic properties turned out to be very small.

It is worth noting the antibacterial chemotherapy drug metronidazole, which turned out to be active against gram-negative highly pathogenic anaerobes (bacteroides, fusobacteria), but little effective against gram-positive anaerobic cocci (peptococci, peptostreptococci).

CONCLUSIONS

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

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

The study of the sensitivity of bacteria to antibiotics has shown that the action spectra of various drugs often do not coincide in relation 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 resulting strains of pathogenic microorganisms.

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

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