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The Microbiological Environment of Wounds and Skin in Patients with Purulent-Inflammatory Diseases of Soft Tissues

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ABSTRACT

Background. Despite the continuous search for new antibacterial drugs, the problem of combating purulent surgical infections of soft tissues remains one of the most complex and urgent. This is due to both changes in the etiological structure of pathogens and the rapid spread of antibiotic resistance among circulating strains.

Material. 105 patients (57 men and 48 women) with purulent-inflammatory soft tissue diseases aged 12 to 80 years were in the purulent surgery department of the multidisciplinary clinic of the Tashkent Medical Academy from 2018 to 2022 examined using the microbiological method.

Conclusion. The use of an express method for determining the antibiotic sensitivity of purulent discharge microflora in purulent-inflammatory diseases of soft tissues in cases of aerobic mono-infection, as well as mixed aerobic-anaerobic mono-infection, allows the use of adequate inotropic therapy in the early stages, which leads to a significant reduction in bed-days and a decrease in the incidence of secondary nosocomial infections.

Keywords: Purulent-inflammatory diseases of soft tissues, aetiology of the disease, diagnosis, aetiotropic therapy

INTRODUCTION

Currently, the problem of purulent-inflammatory diseases of soft tissues is very relevant for practical health care due to the growth of purulent-inflammatory diseases and postoperative complications of the skin and subcutaneous tissue [3].

One of the main features of modern surgical infection of the skin and soft tissues, including phlegmon and abscesses, is the expansion of the spectrum of pathogens related to opportunistic microorganisms, which is apparently associated with a decrease in the body's immune reactivity and negative changes in the composition of the

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symbiotic microflora of the skin in conditions of deteriorating ecology and selective exposure to antibiotics [8].

At the same time, the question of the depth and prevalence of dysbiotic changes in the skin microflora in purulent-inflammatory diseases of soft tissues remains completely unexplored: they are local in nature (only in the lesion) or are observed on the entire surface of the skin [13].

In addition, there are no data on the composition of skin microbiocenosis in patients with purulent-inflammatory soft tissue diseases after aetiotropic therapy, as well as the frequency of elimination of pathogens from the lesion.

Meanwhile, the development of full-fledged ideas about the nature of microbiocenosis (in the lesion and in a symmetrical area of healthy skin) with phlegmons and abscesses at the onset of the disease and after aetiotropic therapy can play a significant role in further deciphering the etiology and pathogenesis of purulent surgical infection of soft tissues, as well as the development of effective methods for restoring colonization resistance of the skin in order to prevent recurrence of infection [18].

The course of purulent-inflammatory diseases of soft tissues is largely determined by the biological properties of microorganisms, namely the presence of adhesive properties, pathogenicity, and persistence factors. However, in contrast to pathogenic properties, the adhesiveness, and persistent characteristics (anti lysozyme and "anti-interferon" activity) of the causative agents of surgical soft tissue infection have been studied extremely insufficiently. At the same time, the presence and level of expression of adhesive, anti-lysozyme and "anti-interferon" activity in pathogens are of interest not only in the theoretical aspect, expanding our knowledge about the pathogenesis of purulent-inflammatory diseases of soft tissues, but also in the applied aspect, namely, to predict the severity of the disease and adequate therapy of the pathology under study [19].

Requires further development and implementation of an express method for determining the antibiotic sensitivity of pathogens of purulent-inflammatory diseases of soft tissues for earlier use of effective aetiotropic therapy.

MATERIALS AND METHODS OF RESEARCH

105 patients (57 men and 48 women) with purulent-inflammatory soft tissue diseases aged 12 to 80 years were in the purulent surgery department of the multidisciplinary clinic of the Tashkent Medical Academy from 2018 to 2022 examined using the microbiological method.

According to the localization of the local inflammatory process, patients with limb lesions prevailed - 58 (55.2%) of the examined. On the trunk, purulent-inflammatory diseases of soft tissues were detected in 34 (32.4%) people; on the head and neck - in 13 (24.4%) patients. Bacteremia was recorded in 36 (34.3%) patients.

All patients underwent therapeutic measures, which included: surgical intervention (opening of the abscess, necrectomy, revision and drainage of the cavity), antibacterial and if indicated, infusion and detoxification therapy.

Purulent contents of purulent-inflammatory diseases of soft tissues on the day of admission of the patient to the department were used as the test material. For comparison, the composition of the symbiont microflora of a symmetrical area of healthy skin was studied.

Identification of isolated cultures of microorganisms was carried out on the species by morphological, tinctorial, cultural, and biochemical properties. The express method determined the adhesive ability of bacteria using formalized human erythrocytes of the O (I) Rh + blood group. The sensitivity of isolated microorganisms to antibiotics was determined by the disc-diffusion method.

Statistical data processing was carried out using the SPSS 8.0 for Windows computer program to calculate mean values and root mean square errors, as well as compare variation series data using parametric methods. The reliability of the differences was determined based on the student's criterion.

RESULTS

As a result of the research, it was found that enterobacteria (55.2%), Staphylococcus aureus (39.1%), non-clostridial anaerobes (34.1%) and control and evaluation media (20.9%) play a leading role in the etiological structure of purulent-inflammatory diseases of soft tissues. Less commonly, the causative agents of the studied pathology were pseudomonas (12.4%), coryneform bacteria (10.5%) and yeast-like fungi of the genus Candida (9.5%). An even smaller proportion of Streptococci (8.6%), hemolytic micrococci (6.7%) and aerobic bacilli (3.8%) had the etiological structure of purulent-inflammatory soft tissue diseases. The intensity of colonization of the lesion by pathogens of purulent-inflammatory diseases of soft tissues varied from 10^2 to 10^8 CFU/ml.

Among enterobacteria, which were the causative agents of purulent-inflammatory diseases of soft tissues, the most common were Proteas (P. mirabilis and P. vulgaris), the share of which in the total structure of the in-

cidence was 18.1%· Escherichia and Klebsiella (K. pneumoniae and Koxytoca) were isolated from the lesion with almost the same frequency - in 13.3% and 12.4% of cases. Other enterobacteria were the causative agents of the pathology under study only in 1.9%-5.7% of cases.

The second place in the etiological structure of purulent-inflammatory diseases of soft tissues was occupied by S. aureus, which was isolated from the lesion in 41 (39.1%) examined patients (Table-1).

Table-1. Etiological characteristics of purulent-inflammatory diseases of soft tissues.

Pathogens	Detection frequency		Intensity of colonization of the lesion	
	n	%	Oscillation range (CFU/ml)	Average (lg CFU /ml)
S.aureus	41	39.1±3.7	10^3-10^7	5.3±1,6
Micrococcus sp.	7	6.7±1.4	10^3-10^6	4.3±1.3
Streptococcus sp.	9	8.6±1.7	10^4-10^7	5.0±0.9
Corynebacterium sp.	11	10.5±2.1	10^3-10^7	4.8±1.5
Proteus sp.	19	18.1±2.7	10^2-10^7	5.1±2.4
E.coli	14	13.3±2.3	10^2-10^7	4.6±2.1
Klebsiella sp.	13	12.4±2.6	10^3-10^7	4.8±2.5
Citrobacter sp.	6	5.7±1.9	10^3-10^5	3.7±1.3
Providencia rettgeri	4	3.8±0.9	10^2-10^6	4.3±1.5
Morganella morganii	2	1.9±0.4	10^3-10^4	3.5±1.0
Pseudomonas sp.	13	12.4±2.6	10^2-10^8	6.2±2.8
Bacillus sp.	4	3.8±0.8	10^3-10^5	4.8±1.5
Peptostreptococcu s sp.	16	15.2±2.9	10^3-10^7	4.4±1.8
Peptococcus niger	5	4.8±1.6	10^3-10^5	4.5±1.6
Bacteroides sp.	11	10.5±3.1	10^4-10^5	4.3±0.6
Prevotella sp.	11	10.5±3.1	10^4-10^5	4.3±0.6
Fusobacterium sp.	4	3.8±0.8	10^3-10^6	3.7±1.9
Eubacterium sp.	3	2.9±0.6	10^4-10^5	4.3±0.5
Veilonella parvula	1	0.9	10^4	
Megasphaera elsdenii	1	0.9	10^4	
Candida sp.	10	9.5±1.9	110^3-10^7	4.5±2.3

Among the control and evaluation agents, the causative agents of purulent-inflammatory diseases of soft tissues were more often S. epidermidis (6.7%) and S. Haemolyticus (5.7%), less often - S. Saprophyticus (2.8%), S. Warneri, S. Intermedius, S. Simulans (1.9% each).

Non-clostridial anaerobes were mainly represented by Peptostreptococcus (15.2%) and Bacteroides Prevotella (10.5%). Peptococcus (4.8%), fusobacterium (3.8%) and eubacteria (2.9%) were present much less often in purulent discharge.

It should be emphasized that non-clostridial anaerobes in most cases (84.6%) were the causative agents of a post-traumatic phlegmon of the upper and lower extremities, as well as abscesses of the gluteal region. Moreover, with phlegmons of the limbs, the main pathogens were Peptostreptococcus, which are part of the opportunistic symbiont microflora of the skin. With abscesses of the gluteal region, the spectrum of non-clostridial anaerobes was much wider and included various representatives of fecal microflora.

Yeast-like fungi of the genus Candida were mainly represented by the species C. albicans, and in isolated cases - C. krusei and C. tropicalis.

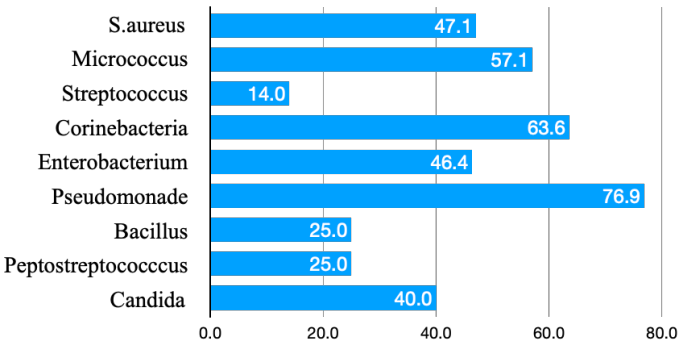
To characterize the frequency of colonization of a symmetrical area of healthy skin by pathogens of purulent-inflammatory diseases of soft tissues, we conditionally designated the frequency of isolation of each pathogen from the lesion as 100.0%. Then, in relation to this indicator, appropriate mathematical calculations were carried out.

The rate of detection of coccal forms of pathogens of purulent-inflammatory diseases of soft tissues (Staphylococcus aureus, hemolytic micrococci, streptococci) in healthy skin compared with the lesion was quite homogeneous and varied between 50.0% and 57.1% (Figure-1).

Among rod-shaped aerobic pathogens of purulent-inflammatory diseases of soft tissues, the highest frequency of colonization of a healthy skin area was found for corynebacterial (63.6%) and pseudomonas (76.9%). Bacilli (25.0%), yeast-like fungi of the genus Candida (40.0%) and enterobacteria (46.4%) were detected much less frequently.

Of the non-clostridial anaerobes involved in purulent-inflammatory diseases of soft tissues, only Peptostreptococcus were present around healthy skin in 25.0% of cases.

Figure 1. Frequency of detection (in %) of pathogens of purulent-inflammatory soft tissue diseases in a symmetrical area of healthy skin.



It should be noted that in patients with purulent-inflammatory diseases of soft tissues, monoinfection was observed only in 32.4% of patients (Figure-2). The dominant causative agent of monoinfection was S. aureus, which was found in 47.1% of cases.

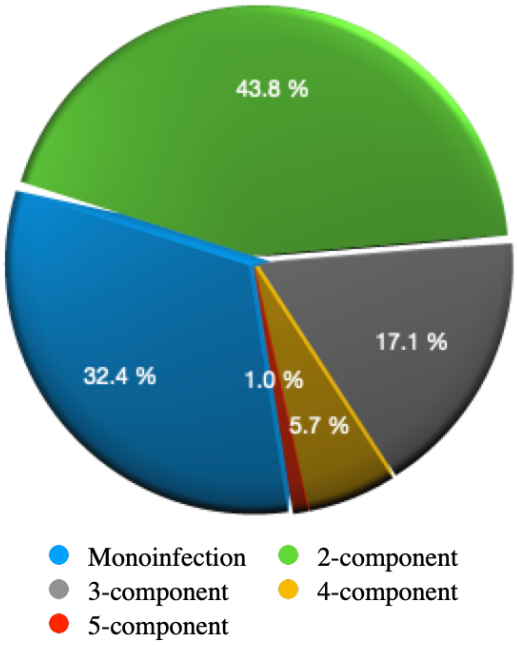


Figure-2. Frequency of occurrence (%) of mono-infection and various variants of mixed infection in purulent-inflammatory diseases of soft tissues

Mixed infection was detected in the majority of the examined (67.6%), which aggravated the clinic and prolonged the course of the disease. The greatest role in the formation of mixed infection was played by 2-component associations of pathogens (43.8%), much less often 3-component (17.1%) and 4-component (5.7%). And only in one case (phlegmon of the foot) an association of 5 pathogens was revealed.

The main associate of the 2-component mixed infection was Staphylococcus aureus, which was more often combined with non-clostridial anaerobes or enterobacteria (38.8% each) and, in isolated cases, with streptococci, hemolytic micrococci, bacilli and candida.

In anaerobic-anaerobic two-component mixed infection, 3 variants of combinations of Peptostreptococcus with other non-clostridial anaerobes - Bacteroides, Fusobacteria and eubacteria were identified.

Studies have shown that in the lesion in most patients (96.2%) there were only pathogens of purulent-inflammatory diseases of soft tissues. Resident skin symbionts were found in only 3.8% of the subjects.

Sufficiently deep dysbiotic changes in the composition of the resident microflora were also detected in all patients in a symmetrical area of healthy skin, that is, outside the lesion (Figure-3).

As can be seen from Figure-3, most often (in 4 1.0% of cases) three representatives of the resident microflora were absent on the skin. Further, in descending order, the elimination of 2 main associates in various combinations was recorded: micrococci and Corynebacterium (26.7%), Corynebacterium (15.2%), and micrococci (7.6%). Much less often (in 1.9 - 4.8% of cases) the absence of one of the representatives of the resident microflora was revealed.

Inhibition of resident microflora in areas of healthy skin of patients with purulent-inflammatory diseases of soft tissues, and, consequently, a decrease in the colonization resistance of this biotope, led to its colonization by representatives of facultative microflora with sufficiently pronounced pathogenic potencies.

It is well known that the onset of the infectious process is largely determined by the degree of adhesion of microbes to the cells of the microorganism. At the same time, in the literature available to us, we did not find data on the adhesive properties of the causative agents of purulent-inflammatory diseases of soft tissues both in the lesion and on the skin.

The study of this trait in 168 cultures of pathogens of purulent-inflammatory diseases of soft tissues showed that 165 (98.2%) strains were adhesive-active, of which 87.4% (Figure-4) had a high and medium degree of severity of the anti-lysozyme activity. Highly adhesive strains were more often present among pseudomonas (92.3%) and Staphylococcus aureus (63.4%), and with a low degree of severity of this symptom - among enterococci and bacilli (according to 50,0%).

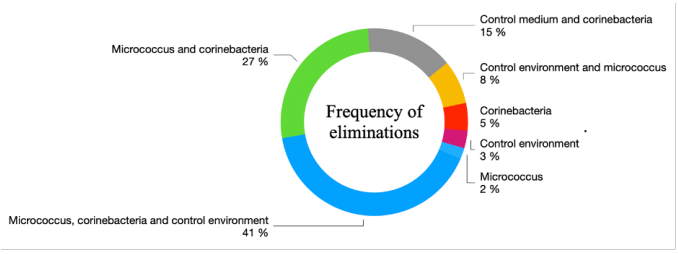
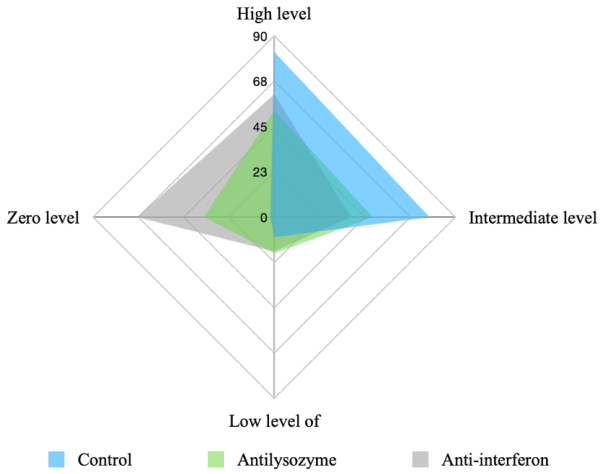


Figure-3. Frequency of elimination (%) of resident symbionts from a symmetrical area of healthy skin in purulent-inflammatory diseases of soft tissues

On symmetrical areas of healthy skin, the proportion of strains of pathogens of purulent-inflammatory diseases of soft tissues with a high and medium level of

anti-lysozyme activity did not have significant differences from the corresponding indicator in the lesion. At the same time, the frequency of isolation of pathogens with a low level of anti-lysozyme activity from a symmetrical area of healthy skin was 1.9 times lower and, on the contrary, with zero activity - 1.4 times higher, than from the purulent contents of phlegmon and abscesses.

Figure-4. Degree of adhesiveness and level of expression of antilysozyme and antiinterferon activity in aerobic pathogens of purulent-inflammatory soft tissue diseases in the lesion focus and in a symmetrical area of healthy skin



When studying the "anti-interferon" factor, it was found that out of 168 cultures of pathogens of purulent-inflammatory diseases of soft tissues, 59.9% of strains had a high and medium level of anti-lysozyme activity, which indicates the high significance of this feature in the characterization of pathogen bio profiles. A high level of anti-lysozyme activity was more often recorded among strains of enterobacteria (50.0%) and Staphylococcus aureus (31.7%).

On symmetric areas of healthy skin, the frequency of isolation of microorganisms with a high and medium level of anti-lysozyme activity was significantly lower (1.8 times), and with a zero level - significantly higher (2 times, $p<0.05$) than in the lesion.

Thus, our data on the wide prevalence of cultures with a high and medium level of adhesiveness, anti-lysozyme and "anti-interferon" activity among the causative agents of purulent-inflammatory diseases of soft tissues indicate their ability not only to colonize the skin but also to resist local protective factors of the body for a long time, which can weigh down and prolong the course of the pathology under study.

Our study of the antibiotic sensitivity of aerobic pathogens of purulent-inflammatory diseases of soft tissues showed the presence of polyresistance to 9-11 antibiotics widely used in medical practice in 68.3 - 100% of the isolated cultures.

Non-clostridial anaerobes in 72.8 - 100.0% of cases were resistant to aminoglycosides. In addition, all cultures of Bacteroides-privately were resistant to Penicillin, erythromycin, and vancomycin; Fusobacteria - to erythromycin, ceftazidime, cefotaxime, vancomycin; eubacteria - to cephalothin, ceftazidime, metronidazole; Peptococcus - to clindamycin.

Thus, in connection with the multidrug-resistant isolated pathogens, to resolve the issue of eliminating specific pathogens of purulent-inflammatory diseases of soft tissues from the lesion, it is necessary to determine their antibiotic sensitivity to a wide range of drugs to select an effective method of treatment.

To prescribe adequate aetiotropic therapy to patients with purulent-inflammatory diseases of soft tissues earlier, we tested an express method for determining the antibiotic sensitivity of the aerobic microflora of purulent discharge in 36 patients with the most severe clinic of the disease when they were admitted to the hospital. In parallel with the express method for the same patients (for comparison), the standard disco-diffusion method was used.

When analyzing the results of the study, it was found (Table-2) a complete coincidence of antibioticograms using two different methods in 26 (72.2%) patients. Of these, 18 patients were diagnosed with mono-infection, the causative agents of which were S. aureus, Proteus mirabilis et vulgaris and Pseudomonas Aeruginosa. The remaining 8 subjects with a complete coincidence of antibioticograms were diagnosed with a 2-component mixed aerobic-anaerobic infection.

Of course, in the last 8 cases, the sensitivity to antibiotics of only one of the components of the mixed infection, namely the aerobic pathogen, was determined. At the same time, as our studies have shown, the use of early aetiotropic therapy (based on the data of the express method) against the aerobic component of mixed infection led to a significant decrease in the clinical manifestations of the disease and an improvement in the overall well-being of patients. It can be assumed that the inhibition of the aerobic associate in mixed aerobic-anaerobic infection entails disturbances in the complex metabolic relationships between pathogens and, as a result, a decrease in their potentiating pathogenic effect.

Later, after setting antibioticograms by the disco-diffusion method for the anaerobic component of the mixed infection, the corresponding additional aetiotropic thera-

py was connected, which in a short time led to the recovery of patients.

A significant discrepancy between the antibioticograms of the aerobic microflora of purulent discharge (for 3 or more drugs) using express and disco-diffusion methods was recorded in 10 (27.8%) of the 36 examined. It should be noted that all these patients had mixed 2- and 3-component aerobic infections caused by Gram-positive and Gram-negative bacteria.

Table 2.
Comparative characteristics of antibioticograms of aerobic microflora of purulent contents of purulent-inflammatory diseases of soft tissues

Characteristics of infection	Number of people surveyed	Complete coincidence of antibioticograms in 2 methods		Mismatch of antibioticograms (for 3 or more antibiotics)	
		n	%	n	%
Aerobic monoinfection	18	18	100	0	0
Mixed aerobic-anaerobic infection	8	8	100	0	0
Mixed aerobic infection	10	0	0	10	100.0

Apparently, in these cases, the express method makes it possible to determine the sensitivity to antibiotics of only one of the causative agents of aerobic mixed infection, which dominates both in the number of viable bacteria in the test material and in the rate of oxidation of glucose, which is part of the liquid nutrient medium of the test system.

The proof of this assumption is the data obtained by us on the determination of antibiotic sensitivity by the disc-diffusion method of pure cultures of aerobic pathogens of mixed infection. If there were 2 or 3 pathogens in the test material, the antibioticograms of pure culture of only one of them coincided with the data of the express method.

Thus, the express method for determining the antibiotic sensitivity of the microflora of purulent discharge in purulent-inflammatory diseases of soft tissues can be used for aerobic mono-infection, as well as for 2-component aerobic-anaerobic infection. The use of this method made it possible to use adequate aetiotropic therapy for 26 (72.2%) patients out of 36 patients from the first day of admission to the hospital, which led to a significant reduction in the time stay in it and avoided the occurrence of secondary nosocomial infections.

At the same time, the disadvantage of the method is the impossibility of its use in multicomponent mixed aerobic infection due to the insufficient information content of the study results.

After completion of aetiotropic therapy and clinical recovery in all patients, the skin microflora was re-studied both in the lesion and in the symmetrical areas of healthy skin to identify qualitative and quantitative changes in the composition of microbiocenosis compared to the onset of the disease.

Studies have shown that out of the total number of microorganisms isolated at the onset of the disease from the lesion (275 strains), 63.6% of pathogen cultures were eliminated from the studied biotope; In 16.7% of cases, there was a significant decrease in their number (100-1000 times). In 3 patients with a 2-component mixed infection, the amount of control and evaluation medium remained unchanged against the background of elimination of Escherichia and Pseudomonas, which were the second component of this infection.

In 34.3% of those examined after treatment, resident microflora appeared at the locus of the primary lesion. However, in 22 (20.9%) people, pathogens that were not isolated at the onset of the disease were found in the focus of primary infection after treatment. S. aureus was found in one patient, bacilli in 2, Klebsiella in 4, and pseudomonas in 5, which is apparently due to infection with hospital strains. In 10 people, yeast-like fungi of the genus Candida appeared in an amount of $>10^4$ CFU, which may have been the result of intensive antibiotic therapy.

On the symmetrical area of healthy skin after aetiotropic therapy, significant changes in the composition of microbiocenosis were also revealed. A high frequency of elimination of opportunistic enterobacteria, pseudomonas, Staphylococcus aureus, and streptococci from the studied area of healthy skin was established, which varied in the range from 66.7 to 100.0%. A pronounced tendency to restore healthy skin in a symmetrical area was revealed. resident species of staphylococci (S. epidermidis, S. saprophyticus) and micrococci.

At the same time, in 10 patients, yeast-like fungi of the genus Candida appeared on a healthy area of the skin after treatment in the amount of 10^3 - 10^6 CFU/sm^2, and in 4 cases their number increased by 10-100 times compared to the onset of the disease.

Attention is drawn to the appearance of healthy skin on a symmetrical area after treatment of pseudomonas in 2 patients and isolated cases - Klebsiella and Bacilli. A

similar process, but with a greater frequency of cases, took place in the lesion.

Thus, in patients with purulent-inflammatory diseases of soft tissues, both in the lesion and the symmetrical areas of healthy skin after the completion of aetiotropic therapy, there was only a tendency to restore the resident symbiotic microflora. The situation was aggravated by an increase in the frequency and intensity of colonization of the described biotopes by yeast-like fungi of the genus Candida, as well as the appearance of nosocomial strains of microorganisms on the skin, which requires the development of additional methods of corrective therapy for the complete restoration of normal skin microbiocenosis and prevention of recurrence of infection.

The data obtained by us on the biological properties of the causative agents of purulent-inflammatory diseases of soft tissues, as well as the composition of microbiocenosis in the lesion and in the symmetrical area of healthy skin before and after aetiotropic therapy are fundamentally new and not only expand our understanding of the pathogenesis of the pathology under study but can also contribute to the development of more accurate diagnostic methods to select adequate tactics for the treatment of these diseases.

DISCUSSION

Our study of the etiological structure of purulent-inflammatory diseases of soft tissues showed a leading role in the pathology of opportunistic enterobacteria, Staphylococcus aureus, and non-clostridial anaerobes, which is consistent with the data of several other researchers [1,11,20].

New data have been obtained on a significant frequency of detection of most pathogens of purulent-inflammatory diseases of soft tissues in a symmetrical area of healthy skin, which varied depending on their species (generic) affiliation [3,5,6].

It is well known that resident symbionts of the skin of healthy people are certain types of micrococci and corynebacterial, which ensure the stability and normal functioning of the microbiocenosis of this biotope [7,11]. In this regard, it was of interest to study the frequency of colonization by this microflora of both the lesion and the symmetrical area of healthy skin in patients with purulent-inflammatory diseases of soft tissues [5,7,9,11,13, 15, 16].

Thus, in all examined patients, purulent-inflammatory diseases of soft tissues also occurred against the background of general dysbiotic changes in the skin, not only in the lesion but also in the area of healthy skin.

Skin dysbiosis, which, as a rule, is combined with a decrease in the immune status and nonspecific resistance of the body, is one of the main risk factors in the formation of purulent-inflammatory diseases of soft tissues [3, 7, 10, 14, 16, 20].

Under the influence of various external (injuries, injections, hypothermia, etc.) and internal (diabetes mellitus, skin trophic disorders, lymph and circulatory disorders, etc.) factors, areas of least resistance (locus resistant minors) appear on the skin, which leads to a sharp increase in the number of opportunistic symbionts already present against the background of elimination or inhibition of resident microflora and, as a result, the development of a purulent-inflammatory process [4,8,12, 16, 18].

The pathogenetic basis of purulent-inflammatory diseases of soft tissues is the microbial-inflammatory process in the skin and subcutaneous tissue, supported by the persistence of pathogens in the corresponding biotope. In the formation of the persistence of microorganisms, a significant role is given to the factors secreted by them inactivating lysozyme and the bactericidal component (intercede) of human leukocyte interferon [1,7, 14, 16].

At the same time, the presence of only a few works devoted to the study of the causative agents of purulent-inflammatory diseases of soft tissues requires further study of this problem.

As our studies showed, the anti-lysozyme sign was present in 74.4% of the studied cultures of phlegmon pathogens and abscesses, of which 59.5% had a high and medium level. It was most common among enterobacteria, pseudomonas and corynebacterial (in 85.7 - 100% of cases). A high level was more often recorded among strains of pseudomonas (53.8%) and enterobacteria (46.5%), which is consistent with the data of a few data from other researchers [2,5,10,13,15].

CONCLUSION

In the formation and development of purulent-inflammatory diseases of soft tissues, enterobacteria, staphylococci and non-clostridial anaerobes play a dominant role, more often in association with other opportunistic bacteria. Among the causative agents of purulent surgical infection of soft tissues, cultures with a high and medium level of adhesiveness, anti-lysozyme activity and "anti-interferon" factor predominate, as well as multidrug resistance, which contributes to their colonization of the skin, as well as protection against local non-specific resistance factors.

In purulent-inflammatory diseases of soft tissues, profound dysbiotic changes in the symbiotic microflora are observed not only in the lesion but also in a symmetrical area of healthy skin. After aetiotropic therapy and clinical recovery in patients who have undergone purulent-inflammatory diseases of soft tissues, against the background of elimination or reduction in the number of pathogens, there is no complete restoration of the resident microflora of the skin, and in some cases, pathological microbiocenosis are formed from yeast-like fungi of the genus Candida and hospital strains of bacteria.

The revealed high frequency of mixed infection in purulent surgical infection of soft tissues, as well as multidrug resistance of most pathogens, determine the need to use an extended microbiological research method for phlegmons and abscesses with the determination of the antibiotic sensitivity of aerobic and anaerobic pathogens to a wide range of antibacterial drugs.

In purulent-inflammatory diseases of soft tissues for diagnostic purposes, it is necessary to use an extended microbiological study using modern aerobic and anaerobic technologies. At the same time, due to the high frequency of multidrug resistance in pathogens of phlegmon and abscesses, their antibiotic sensitivity to a wide range of drugs should be determined to select effective aetiotropic therapy.

An express method for determining the antibiotic sensitivity of the microflora of purulent contents of purulent-inflammatory diseases of soft tissues can be used for aerobic mono-infection and 2-component aerobic-anaerobic infection, which leads to a significant reduction in bed days and a decrease in the incidence of secondary nosocomial infections. At the same time, after aetiotropic treatment, patients who have undergone purulent-inflammatory diseases of soft tissues need to undergo a course of corrective therapy to fully restore the normal symbiont microflora of the skin and prevent the recurrence of infection.

Ethics approval and consent to participate - All patients gave written informed consent to participate in the study.

Consent for publication - The study is valid, and recognition by the organization is not required. The author agrees to open the publication.

Availability of data and material – Available.

Financing – No financial support has been provided for this work.

Conflict of interest - The authors declare that there is no conflict of interest.

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YUMSHOQ TO'QIMALARNING YIRINGLI YALLIG'LANISH KASALLIKLARI BO'LGAN BEMORLARDA YARALAR VA TERINING MIKROBIOLOGIK MUHITI

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ABSTRAKT

Dolzarbligi. Yangi antibakterial dorilarni doimiy ravishda qidirishga qaramasdan, yumshoq to'qimalarning yiringli jarrohlik infektsiyasi bilan kurashish muammosi eng murakkab va shoshilinch muammolardan biri bo'lib qolmoqda. Bu patogenlarning etiologik tuzilishidagi o'zgarishlar va aylanuvchi shtammlar orasida antibiotiklarga chidamlilikning tez tarqalishi bilan bog'liq.

Material. 2018-2022 yillarda Toshkent tibbiyot akademiyasining ko'p tarmoqli klinikasida yiringli jarrohlik bo'limida bo'lgan 12 yoshdan 80 yoshgacha bo'lgan yumshoq to'qimaldrning yiringli kasalliklari bilan og'rib chiqilgan 105 nafar bemor (57 erkak va 48 ayol) mikrobiologik usul yordamida tekshirildi.

Xulosa. Aerob monoinfektsiya holatlarida yumshoq to'qimalarning yiringli yallig'lanish kasalliklarida yiringli oqindi mikrofloraning antibiotik sezgirligini aniqlash uchun ekspress usulni qo'llash, shuningdek aralash aerobik-anaerob monoinfeksiya bilan birga dastlabki bosqichlarda etarli darajada etiotrop terapiyadan foydalanishga imkon beradi, bu esa yotoq-kunlarning sezilarli darajada kamayishiga va ikkilamchi nozokomial infektsiyalar bilan kasallanishning kamayishiga olib keladi.

Kalit so'zlar: yumshoq to'qimalarning yiringli yallig'lanish kasalliklari, kasallikning etiologiyasi, tashxis, etiotrop terapiya

МИКРОБИОЛОГИЧЕСКАЯ СРЕДА РАН И КОЖИ У БОЛЬНЫХ С ГНОЙНО-ВОСПАЛИТЕЛЬНЫМИ ЗАБОЛЕВАНИЯМИ МЯГКИХ ТКАНЕЙ

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АБСТРАКТ

Актуальность. Несмотря на непрерывный поиск новых антибактериальных препаратов, проблема борьбы с гнойной хирургической инфекцией мягких тканей остается одной из наиболее сложных и актуальных. Это связано как с изменением этиологической структуры возбудителей, так и быстрым распространением антибиотикорезистентности среди циркулирующих штаммов.

Материал. Были обследованы с помощью микробиологического метода 105 больных (57 мужчин и 48 женщин) с гнойно-воспалительными заболеваниями мягких тканей в возрасте от 12 до 80 лет, находившихся в отделении гнойной хирургии многопрофильной клиники Ташкентской медицинской академии с 2018 по 2022 годы.

Заключение. Применение экспресс-метода определения антибиотикочувствительности микрофлоры гнойного отделяемого при гнойно-воспалительных заболеваниях мягких тканей в случаях аэробной моноинфекции, а также смешанной аэробно-анаэробной позволяет использовать в ранние сроки адекватную этиотропную терапию, что приводит к значительному сокращению койко-дней и снижению частоты возникновения вторичных госпитальных инфекций.

Ключевые слова: гнойно-воспалительные заболевания мягких тканей, этиология заболевания, диагностика, этиотропная терапия