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INFLUENCE OF NARROWLY SPECTRAL INFRARED RAYS ON MICROFLORA OF PURULENT WOUND IN COMPLEX THERAPY FOR ACUTE ODONTOGENIC OSTEOMYELITIS OF MANDIBLE IN CHILDREN

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Abstract. There investigated influence of narrowly spectral infrared rays on microflora of purulent wound in complex therapy for acute odontogenic osteomyelitis of mandible in children. It has been established that when used narrowly spectral infrared rays in complex therapy of suppurative wound of acute odontogenic osteomyelitis of mandible in children on 7-8 day of treatment pathogen and conditionally pathogen bacteria totally eliminated from wound, common condition of patient improves and local clinical signs of acute process are reduced.

Key words: odontogenic osteomyelitis, microflora, narrowly spectral infrared rays.

Background

Problem of treatment of sick children with inflammatory diseases of maxillo-facial area becomes the more significant that occupies one of the first paces in inflammatory maxillofacial surgery (3,9,10,11). In recent years character of inflammatory diseases of maxillofacial area course in children has been changed. Reasons of qualitative changes of clinical course of odontogenic inflammatory diseases are constantly changed ecological factors and social life conditions. The increase of resistant to antibiotics forms of microorganisms, irrational use of medications as well as inhibition of immunological body responsiveness determine a lot the character of inflammatory diseases and its outcome [3, 9, 10].

Tendency of spread of inflammatory processes of maxillofacial area is clear by the appearance of antibiotic-resistant microorganisms. Therefore, the methods of inflammatory diseases treatment requires further improvement. Principle of pathogenetic treatment of wound provides obligatory verification of infection causative agent and use of antibacterial medications subject to susceptibility of microorganisms to them. Study of qualitative and quantitative microflora characteristics is able to predict objectively the development of wound process and value efficacy of that or other method of treatment. In recent decades character of micro-flora, its virulence and adaptability has been changed significantly [1, 2, 4, 8, 11].

Based on previous conducted investigations, appropriateness of narrowly spectral infrared rays after suppurative focus opening in complex therapy of acute odontogenic osteomyelitis has

been substantiated that differs from other physical factors effect on pathological body processes at molecular level [5-7].

In this connection we aimed to: study influence of narrowly spectral infrared rays on microflora of suppurative wound in dynamics of complex therapy for acute odontogenic osteomyelitis of mandible in children.

Material and methods

To determine aimed purpose we examined 150 children over 2006-2008 yy. aged from 4 to 8 years old with acute odontogenic osteomyelitis of mandible complicated by diffuse phlegmons of surrounded jaw tissue (submaxillary, pteromaxillary and parotid-masticatory spaces) admitted to clinic on 7-10 day after the onset of disease. On the same day all patients were extracted causal teeth under a narcosis under indications, opened suppurative focus, made bathing of a wound by antiseptics and drained. Investigated sick children were divided on 2 groups: I group – (75 children) received traditional treatment within a week included antibacterial, symptomatic, desintoxicated, desensitized, general health-improving therapy and on 2 day locally administrated infrared rays within 10 days. II group – (75 children) along traditional treatment patients irradiated by narrowly spectral infrared rays of series RC, GI, ZB, KL и KB by Rakhimov on 2 day within 10 days [5-7]. Material were taken of children: on 1, 5, 8 day after operation. All patients were made qualitative and quantitative microflora analysis of suppurative wounds by common microbiological techniques [4, 8]. The obtained results are statistically processed by a method of variation statistics with use of a package of applied programs for IBM PC AT.

Results

Study results showed that in admission to clinic the more character clinical signs were pain, face asymmetry due to inflammatory swelling, hyperemia of cutaneous covering, presence of infiltrate and fluctuation. By 8-9 day of treatment with traditional therapy in children: weakness, appetite disorder, pulse beating increase, discharge of pus from wound, swelling and increase of regional lymph nodes has partially remained. The use

of narrowly spectral infrared rays in the complex therapy for odontogenic osteomyelitis of mandible in children diminishes discharging of wound, edema of soft tissues and disappearance of pains by 7-8 day.

Studied patients with acute odontogenic osteomyelitis of mandible complicated by diffuse phlegmons of surrounded jaw tissues in pus were secreted gram- positive, gram-negative bacteria and Candida fungi. General statistical data by bacteriological investigations results were shown in table 1.

As the obtained data of microflora wound show in acute odontogenic osteomyelitis of mandible in children was different and includes itself as pathogenic, opportunistic and saprophytic microorganisms.

In 150 The role of all these microorganisms is not single in suppurative wound in pathogenesis. For example, St.epidermidis, Candida, E.coli are specimen of normal skin microflora and mucous membranes. When analyzed bacteriological plating results, it has been established that bacteria of one type (monoinfection) and associations of several microorganisms revealed from pus. St. aureus, Str. epidermidis, St.pyogenes, E coli, St. hemolyticus are found fairly often in monoinfection (52%). Gram- positive, gram-negative bacteria and saprophytes were more frequently in associations (48%). Before discharging from clinic examination specimens of normal microflora excreted from separable in wound.

In patients with acute odontogenic osteomy-

elitis of mandible complicated by diffuse phlegmons of surrounded jaw tissues Staphylococci and Streptococci were more often plated in pus (table 2).

Studying of quantitative parameters of microorganisms in these patients show that from anaerobe flora the most past has made Peptostreptococi the number of which being $7,85 \pm 0,24$ Lg KOE/ml. suppurating. The amount of facultative flora also was considerable and among them a great bulk made Staphylococci $6,64 \pm 0,45$ Lg KOE/ml, Streptococci $5,10 \pm 0,28$ Lg KOE/ml the lowest parameters in microbes concerning genus of olm. Against traditional treatment by 7-8 day of microbe excreting from wound on ratio to basic line decreased as follows: bacteroids in 46,9%, peptostreptococi in 58%, blue pus bacillus in 40,2%, staphylococcus gold in 50,4%, staphylococcus epidermis in 40,4%, streptococcus piogenic in 46,3%, streptococcus hemolytic in 44,2%, enterococcus coli in 39,8% и olm in 32,7%. But the amount of Candida fungi does not diminish; and on the contrary tends to grows to 7-8 day. We obtained most interesting data when used narrowly spectral infrared rays in the complex therapy of patients with odontogenic osteomyelitis of mandible. There was positive dynamics towards decrease in number of microorganisms.

After 4th session of narrowly spectral infrared rays the number of all microorganisms sharply decreased – gram-negative enterobacteria and gram-positive cocci ($p < 0,05$). Candida fungi reduced to minimum titers (1,00 Lg KOE/мл) and

Table 1. Spectrum of microorganisms secreted pus of phlegmons in odontogenic osteomyelitis of mandible in children

№	Name of microorganisms	Phlegmons (n=150)	
	Total number of anaerobes	n=45	100%
1.	Bacteroids	17	37,8
2.	Peptostreptococci	16	35,6
3.	Blue pus bacillus	12	26,6
	Total number of aerobes	n=105	100%
1.	Staphylococcus gold	20	19,3
2.	Staphylococcus epidermis	14	13,3
3.	Streptococcus piogenic	12	11,4
4.	Streptococcus hemolitic	18	17,1
5.	Enterococcus coli	15	14,2
6.	Candida fungi	14	13,3
7.	Olm	12	11,4

Table 2.

Quantitative characteristics of changes of microflora pus in children with acute odontogenic osteomyelitis of mandible complicated by diffuse phlegmons of surrounded jaw tissues in different ways of treatment

№	Groups of microbes	Amount of microbes per 1ml pus in patients				
		1 day (n=150) Basic line	In traditional treatment (n=75)		In proposed treatment (n=75)	
Total amount of anaerobes			5-day	8-day	5-day	8-day
1.	Bacteroids	7,72±0,63	6,24±0,44	4,10±0,31*	2,54±0,52*	–
2.	Peptostreptococci	7,85±0,24	6,47±0,51	3,30±0,21*	1,47±0,12*	–
3.	Blue pus bacillus	7,25±0,37	6,30±0,41	4,34±0,65*	2,75±0,42*	–
Total amount of aerobes						
1.	Staphylococcus gold	6,64±0,45	5,40±0,38	3,30±0,12*	1,22±0,24*	–
2.	Staphylococcus epidermis	5,82±0,42	4,15±0,27	3,47±0,14*	1,87±0,21*	0,25±0,1
3.	Streptococcus piogenic	5,10±0,28	4,34±0,18	2,74±0,21*	1,34±0,28*	–
4.	Streptococcus hemolytic	4,80±0,43	3,53±0,45	2,68±0,16*	1,15±0,26*	–
5.	Enterococcus coli	3,32±0,20	2,90±0,12	2,0±0,21*	1,68±0,34*	–
6.	Candida fungi	3,15±0,32	3,67±0,32	4,10±0,29*	1,76±0,25*	–
7.	Olm	2,82±0,18	2,45±0,23	1,90±0,14*	1,64±0,18*	–

n – number of examined children; * – P < 0,05. reliability on ratio to control

completely eliminated before discharging (to 8 day), except St epidermidis which as a specimen of normal skin flora was plated at lower critical level.

Discussions

Thus, the use of narrowly spectral infrared rays in the complex therapy of suppurative wound in odontogenic osteomyelitis of mandible complicated by diffuse phlegmons of surrounded jaw tissues in children sharply reduces the amount of microorganisms lower critical bacterial threshold. By 7-8 day pathogen and opportunistic pathogenic bacteria have eliminated from wound. Positive grampositive flora does not suffer with this and occupies pathological focus that stimulates to quicker wound clearing. It was shown clinically that on 5-8 day of treatment common and local clinical signs of acute odontogenic osteomyelitis as edema of soft tissues decreased, pains disappeared, exudation from wound considerably diminished, intoxication reduced, pulse, body temperature, sleep and appetite was normalized (on 4-5 day), dyspeptic occurrence disappeared (on 4-5 day).

Conclusions

1. The use of narrowly spectral infrared rays in the complex therapy of acute odontogenic osteomyelitis of mandible in children stimulates ear-

ly disappearance of intoxication signs (normalization of body temperature, sleeping, appetite, blood indices), local signs of suppurative process (pain disappearance, edema of soft tissues, reducing of exuding from wound and its earlier clearing).

2. Inclusion in the complex therapy of acute odontogenic osteomyelitis of mandible complicated by diffuse phlegmons of surrounded jaw tissues narrowly spectral infrared rays influences both qualitative and quantitative structure of microflora that was shown in considerable decrease (in 2 times) of plating of facultative flora on 5 day.

ВЛИЯНИЕ УЗКОСПЕКТРАЛЬНЫХ ИНФРАКРАСНЫХ ЛУЧЕЙ НА МИКРОФЛОРУ ГНОЙНОЙ РАНЫ ПРИ КОМПЛЕКСНОЙ ТЕРАПИИ ОСТРОГО ОДОНТОГЕННОГО ОСТЕОМИЕЛИТА НИЖНЕЙ ЧЕЛЮСТИ У ДЕТЕЙ

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Реферат. Исследовано влияние узкоспектральных инфракрасных лучей на микрофлору гнойной раны при комплексной терапии острого одонтогенного остеомиелита нижней челюсти у детей. Установлено, что при применении узкоспектральных инфракрасных лучей в комплексном лечении гнойной раны острого одонтогенного остеомиелита нижней челюсти

у детей к 7-8 дню лечения из раны полностью элиминируются патогенные и условно-патогенные бактерии, улучшается общее состояние больного и уменьшаются местные клинические признаки острого процесса.

Ключевые слова: одонтогенный остеомиелит, микрофлора, узкоспектральный инфракрасный луч.

ВПЛИВ ВУЗЬКОСПЕКТРАЛЬНИХ ІНФРАЧЕРВОНИХ ПРОМІНІВ НА МІКРОФЛОРУ ГНІЙНОЇ РАНИ ПРИ КОМПЛЕКСНІЙ ТЕРАПІЇ ГОСТРОГО ОДОНТОГЕННОГО ОСТЕОМІЄЛІТУ НИЖНЬОЇ ЩЕЛЕПИ У ДІТЕЙ

А.Л. Хасанов

Реферат. Досліджено вплив вузькоспектральних інфрачервоних промінів на мікрофлору гнійної рани при комплексній терапії гострого одонтогенного остеомиєліту нижньої щелепи у дітей. Встановлено, що при використанні вузько спектральних променів у комплексному лікуванні гнійної рани гострого одонтогенного остеомиєліту нижньої щелепи у дітей к 7-8 дню лікування з рани повністю елімінуються патогенні та умовно патогенні бактерії, поліпшується загальний стан хворого та зменшуються місцеві клінічні ознаки гострого процесу.

Ключевые слова: одонтогенный остеомиелит, микрофлора, одонтогенный остеомиелит, микрофлора, вузькоспектральний інфрачервоний промінь.

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