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ANALYSIS OF THE MAIN ACTIVITY CARIESGENIC MICROBES BY ASSESSING THE ANTIBIOTIC ACTIVITY

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Summary: Comparing antibiotic sensitivity acid-basic culture of streptococci set much lower activity of Streptococcus sobrinus, which indicates considerable aggressiveness of this type of microorganisms, which evidenced by the increase in the activity of caries. The presence in the composition of the microbiota saliva is Streptococcus sobrinus marker formation and rapid progression of the lesions of hard tissues of teeth and needs of traditional preventive measures and preventive treatment using the methods and means nutrytseptyv food.

Key words: cariesgenic microbes, antibiotic activity

Actuality. In the available sources of scientific literature great attention is paid to the study of microbiological status of children and adolescents with the establishment of the prevalence of certain kinds of microorganisms as etiological factors of the main occurrence and progression of dental diseases. However, the main role in causing disease play factors of local and general immune status and physical health of the body, especially in childhood [1,3,5,7,8,12-14].

In conducting epidemiological studies among children of Transcarpathian region was found that the there are significant ethnic factor in causing diseases. Children of Roma ethnic group, the incidence of tooth decay significantly lower in contrast to children Ukrainian, Hungarian, Slovak, Polish ethnic group. While isolate pure ethnic group is difficult, but with the prevalence Roma prevalence of caries activity and lower [2, 4, 6, 9].

To study were selected children who permanently reside in natural iodine- fluorine deficiency, their nature and composition of the nutritional status of children did not differ significantly, oral hygiene generally flush, poor, this prompted speculate on the correlation microbial landscape of local immunity factors combined with total immunity and status as the main factors in the development and progression of major dental diseases among children [1-5, 9-12].

For clinical justification and establish the reliability of the assumptions was conducted the state of ecological community of the oral cavity and immunological status of 146 children with different degree of of caries activity, aged 3-8 years, who permanently live in terms of biochemical deficits of different ethnic groups. A survey of children was conducted after informed consent of parents or guardians of LLC "Dental clinic" Dental Faculty SHEI "Uzhhorod National University". Microbiological and immunological studies were conducted in microbiological laboratories Transcarpathian Ukraine Branch of microbiologists name S.M.Vynohradskoho - TUBM. The data presented in Table 1

Table 1

Average examined depending on ethnicity and level of activity of caries

Number inspected	Children with compensated caries		Children with subcompensated caries		Children with decompensated caries		Healthy Children	
	abc	%	abc	%	abc	%	abc	%
Roma ethnic group (n=37)	12	8,2	-	-	-	-	25	17,1
Other ethnic groups (n=109)	23	15,7	26	17,8	35	23,9	25	17,1
Together (n=146)	35	23,9	26	17,8	35	23,9	50	34,2

Among the 146 examined children, 37 were persons of Roma ethnic group that made 25.3%, 109 children were of other nationalities that made 74.7%. The children were divided into groups depending on the activity of caries, namely the 35 children with compensated caries (23.9%), 26 children with caries subcompensated (17.8%), 35 children with decompensated caries (23.9%) and 50 healthy children, 25 Roma ethnic group and 25 other ethnic groups that made up the control group.

Results research and discussion. To study the culture of the main activity of caries microorganisms, including Streptococcus mutans and Streptococcus sobrinus were investigated antibiotic sensitivity of the culture to 34 representatives of antibiotics, which determined stunting colonies (in mm) after 24 hours of cultivation.

Sensitivity to antibiotics was determined disco-diffusion method. Seed culture was carried out on Mueller-Hinton medium, thick lawn seeding method on the surface of the agar in Petri dish and set disks with antibiotics in therapeutic doses (6-7 discs per Petri dish). Preparation of culture media and microbial culture (inoculum) seeding and incubation was carried out by conventional standards approved in laboratory microbiological diagnosis according to Ministry of Health of Ukraine Decree № 167 of 05.04.2007. Approval of The results were evaluated after 24 hours of cultivation ruler determined the diameter of stunted growth culture in mm. Interpretation: 0-13 mm - R resistant culture, 14-19mm - R / S - umovnorezystentana culture, more than 20 - S - sensitive culture.the guidelines "Determining the sensitivity of microorganisms to antibiotics."

In measuring zones of stunted growth oriented to a zone of complete inhibition of visible growth. Very small colonies that are manifested in stunted growth within the zone only under special lighting conditions or increasing, and barely noticeable plaque at the edge of zone did not take into account.

The results are shown in Table 2 and 3. S - sensitive culture m / o; R - resistant culture m / o, R / S - moderately sensitive / resistant culture m / o.

Established that Streptococcus mutans is sensitive to more than two-thirds of antibiotics, which were subject to testing. Resistant is only 9 kinds of antibiotics, namely sparfloxacin, spiramycin, streptomycin, gatifloxacin, erythromycin, clarithromycin, lincomycin, oleandomycin and nalidixic acid.

In the rest of the acts of antibiotic growth inhibition is observed, indicating a slight aggressiveness of this type kystoloutvoryuyuchoho streptococcus. The maximum effect with macrolides and ihibitory protein synthesis. The maximum effect with tsefalesyn (35mm) Amoxiclav (up to 40mm) and rifampicin (up to 35mm).

Table 2

Determination of antibiotic sensitivity culture Streptococcus mutans

№	Antibiotics	Abbreviation	The international abbreviation, dosage	Streptococcus mutans, mm	Interpretation
1	Azithromycin		AZM^{15}	25	S
2	Amoxiclav	AMC	AC^{30}	40	S
3	Ampicillin / sulbactam	AMP	A/S$^{10/10}$	27	S
4	Vancomycin	VA	VA^{30}	26	S
5	Gatifloxacin		GAT^{5}	10	R
6	Gentamicin		HLG^{120},GEN^{10}	35	S
7	Erythromycin		E^{15}	0	R
8	Clarithromycin		CLR^{15}	0	R
9	Levofloxacin	LFC	LE^{5}	24	S
10	Lincomycin	LIN	L^{10}	0	R
11	Meropenem	MPN		24	S
12	Moxifloxacin	MOX	MO^{5}	25	S
13	Nalidixic acid		NA^{30}	5	R
14	Netilmicin		NET^{30}	22	S
15	Novobiotsyn		NV^{30}	24	S
16	Oleandomycin		OL^{15}	0	R
17	Penicillin G		P^{10}	15	R/S
18	Piperacillin		PI^{100}	25	S
19	Polymyxin B		PB^{300}	19	R/S
20	Rifampicin		R^{5}, RIF^{5}	35	S
21	Sparfloxacin		SPX^{5}	0	R
22	Spiramycin		SR^{100}, SR^{30}	0	R
23	Streptomycin		S^{10}	0	R
24	Tetracycline		TE^{30}	26	S
25	Tykartselin		TI^{75}	15	R/S
26	Tykartselin / clavulanic acid		TCC$^{75/10}$	15	R/S
27	Tobramycin		TOB^{10}	30	S
28	Fosfomycin		FO^{200}	25	S
29	Tsefaleksin		CP^{30}	35	S
30	Cefepime	CP	CPM^{30}	15	R/S

31	Cefpodoxime		CEP^{10}, CPD^{10}	12	R/S
32	Ceftazidime / clavulanic acid		CAC$^{30/10}$	19	R/S
33	Ceftriaxone	CFA	CI^{30}, CTR^{30}	12	R/S
34	Cefuroxime		CXM^{30}	16	R/S

Table 3

Determination of antibiotic sensitivity culture Streptococcus sobrinus

№	Antibiotics	Abbreviation	The international abbreviation, dosage	Streptococcus mutans, mm	Interpretation
1	Azithromycin		AZM^{15}	0	R
2	Amoxiclav	AMC	AC^{30}	25	S
3	Ampicillin / sulbactam	AMP	A/S$^{10/10}$	17	R/S
4	Vancomycin	VA	VA^{30}	18	R/S
5	Gatifloxacin		GAT^{5}	8	R
6	Gentamicin		HLG^{120},GEN^{10}	19	R/S
7	Erythromycin		E^{15}	0	R
8	Clarithromycin		CLR^{15}	0	R
9	Levofloxacin	LFC	LE^{5}	14	R/S
10	Lincomycin	LIN	L^{10}	0	R
11	Meropenem	MPN		14	R/S
12	Moxifloxacin	MOX	MO^{5}	15	R/S
13	Nalidixic acid		NA^{30}	0	R
14	Netilmicin		NET^{30}	20	S
15	Novobiotsyn		NV^{30}	24	S
16	Oleandomycin		OL^{15}	0	R
17	Penicillin G		P^{10}	6	R
18	Piperacillin		PI^{100}	22	S
19	Polymyxin B		PB^{300}	9	R
20	Rifampicin		R^{5}, RIF^{5}	28	S
21	Sparfloxacin		SPX^{5}	0	R
22	Spiramycin		SR^{100}, SR^{30}	0	R
23	Streptomycin		S^{10}	0	R
24	Tetracycline		TE^{30}	16	R/S
25	Tykartselin		TI^{75}	15	R/S
26	Tykartselin / clavulanic acid		TCC$^{75/10}$	15	R/S
27	Tobramycin		TOB^{10}	22	S
28	Fosfomycin		FO^{200}	29	S
29	Tsefaleksin		CP^{30}	23	S

30	Cefepime	CP	CPM^{30}	0	R
31	Cefpodoxime		CEP^{10}, CPD^{10}	0	R
32	Ceftazidime / clavulanic acid		$CAC^{30/10}$	12	R
33	Ceftriaxone	CFA	CI^{30}, CTR^{30}	0	R
34	Cefuroxime		CXM^{30}	0	R

S - sensitive culture m / o; R - resistant culture m / o, R / S - moderately sensitive / resistant culture m / o.

Established that culture is resistant Streptococcus sobrinus to 17 kinds of antibiotics 34 set, ie 50%, ie stunting colonies within 24 hours was in the range from 0 to 12 mm. Conditionally resistant colonies delayed growth from 13 to 19mm in 24 hours was 9 species sensitivity to antibiotics. Sensitive culture was only 8 antibiotics, growth inhibition is observed after 24 hours of culture more than 20 mm. The maximum sensitivity was reserve antibiotics that inhibit protein synthesis and nucleic acids, in particular fosfomycin (29mm), rifampicin, who belongs to the group of inhibitors of RNA polymerase (28mm), and to Amoxiclav (25mm). Sensitivity to antibiotics novobiotsyn manifested in the growth of the colonies delay of up to 24 mm, cephalexin - up to 23mm, tobramycin and piperacillin - up to 22mm, netilmicin - up to 20 mm.

Conclusions. Comparing antibiotic sensitivity acid-basic culture of streptococci set much lower activity of Streptococcus sobrinus, which indicates considerable aggressiveness of this type of microorganisms, which evidenced by the increase in the activity of caries. The presence in the composition of the microbiota saliva is Streptococcus sobrinus marker formation and rapid progression of the lesions of hard tissues of teeth and needs of traditional preventive measures and preventive treatment using the methods and means nutrytseptyv food.

REFERENCES

1. Захаров А.А. Анализ микрофлоры ротовой полости обследованных людей с различными заболеваниями / А.А. Захаров, Н.А. Ильина // Успехи современного естествознания. - 2007. - № 12. - С. 353 - 355.

2. Кузнецов, Е.В. Микробная флора полости рта и её роль в развитии; патологических процессов / Е.В.Кузнецов, В.Н.Царёв. — М.: МЕДпресс-информ, 2003. – 240 с.

3. Леус П.А. Биофильм на поверхности зуба и кариес / П.А. Леус. М.: Издательский Дом «STBOOK», 2008.- 88с.

4. Тец В.В. Роль микрофлоры полости рта в развитии заболеваний человека / В.В. Тец // Стоматология, 2008. №3. - С.76-80.

5. Al-Asqah M. Is the presence of Helicobacter pylori in the dental plaque of patients with chronic periodontitis a risk factor for gastric infection?/ M. Al-Asqah, N. Al-Hamoudi, W. K. Al-Hamoudi // Can J Gastroenterol. – 2009. – Vol. 23(3). – P.177–179

6. Belstrum D. Bacterial profiles of saliva in relation to diet, lifestyle factors, and socioeconomic status/ D. Belstrum, P. Holmstrup, C. H. Nielsen et al. // J Clin Periodontol. – 2014 – Vol.41(2). – P. 104 – 112 .

7. Haffajee A.D. Microbial complexes in supragingival plaque / S.S. Socransky, A.D. Haffajee, M.R. Patel, X. //Song Oral Microbiol Immunol. - 2008. - №23. – P.196–205.

8. Jia C.L. Effect of dental plaque control on infection of Helicobacter pylori in gastric mucosa / C.L. Jia, G.S. Jiang, C.H. Li, C.R. Li // Tex Dent J. 2012 Vol.129(10). P.1069-1073.

9. Kaakoush N.O. Campylobacter concisus - A new player in intestinal disease / N.O. Kaakoush, H.M. Mitchell // Front Cell Infect Microbiol. – 2012. - № 2. _ P.2-4.

10. Ly M. Altered Oral Viral Ecology in Association with Periodontal Disease / M. Ly, S. R. Abeles, T. K. Boehm et al. // MBio. - 2014. – Vol. 5, № 3. – P. 1133-1147.

11. Mahajan A. Interspecies Communication and Periodontal Disease/ A. Mahajan, B. Singh, D. Kashyap et al. // The Scientific World Journal. – 2013. - Vol.2013. – P. 765434

12. Said H.S. Dysbiosis of Salivary Microbiota in Inflammatory Bowel Disease and Its Association With Oral Immunological Biomarkers/ H. S. Said , W. Suda., S. Nakagome et al. // DNA RESEARCH. – 2014. - № 21. – P.15–25.

13. Salazar C.R. Association between selected oral pathogens and gastric precancerous lesions/ C.R. Salazar, J.Sun, Y. Li et al. // PLoS One. – 2013. № 8(1). – P.e51604.

14. Socransky S.S. Microbial complexes in subgingival plaque / S.S. Socransky, A.D. Haffajee, M.A. Cugini et al.// J Clin Periodontol. – 1998. - №25. – P.134–144.