

: 616.314.17-008.1:616-001.34]-036-092-084-08

»,  
• „ • •  
- ( - .- .  
( . ., . . . ) «  
» ( . 0112U002382; 2012-2014 .)  
•  
,  
,  
,  
,  
,  
[1-6],  
,  
,  
,  
( ).  
,  
,  
-  
-  
-  
-  
[2, 6, 9].  
[3] ,  
(  
[8, 11].

,  
 .  
 ( )  
 : (n<sub>0</sub>=129)  
 ; (n<sub>1</sub>=129)  
 ( - <sup>1</sup>n<sub>1</sub>=63  
 .. - <sup>2</sup>n<sub>1</sub>=66  
 ).  
 . . ( . 57512,  
 ( -  
 ) : -  
 (PMA), ( -S),  
 ( ),  
 ( .. )  
 (CPITN) [13].  
 ,  
 .  
 ,  
 , (65,9±4,2)%  
 ( 0,05) - (26,4±3,9)%  
 ( 60 ), :  
 , - . ( (18,2±4,7)% (34,9±6,0)%, 0,05),  
 (CPITN)  
 , ( - - (20,6±5,1)%,  
 ) (31,0±4,1)% ( 0,05.  
 - (40,9±6,1)% ) (1,6±1,1)%  
 (35,7±4,2)% (36,4±4,2)%  
 .  
 ,  
 .  
 ,  
 ,  
 ( . 1).

							,	,	2, %	=
			n <sub>1</sub> =129		n <sub>0</sub> =129					
			.	( ±m)%	.	( ±m)%				
1	( )	60	41	31,8±4,1	85	65,9±4,2	-3,1	0,540	21	0,001
		59÷50	38	29,5±4,0	41	31,8±4,1	-0,3	0,004		
		49÷40	33	25,6±3,8	2	1,6±1,6	+6,4	1,463		
		39	17	13,2±3,0	1	0,8±0,8	+4,7	0,763		
			129	100,0	129	100,0	-	2,770		
2	( )	0,0-1,0	2	1,6±1,1	14	10,9±2,7	-8,5	0,393	18	0,001
		1,1÷2,0	41	31,8±4,1	66	51,2±4,4	-2,0	0,200		
		2,1÷3,0	46	35,7±4,2	47	36,4±4,2	0	0,000		
		3,1÷4,0	40	31,0±4,1	2	1,6±1,1	+12,0	1,916		
			129	100,0	129	100,0	-	2,510		
3	( )	5	2	1,6±1,1	3	2,3±1,3	-1,7	0,007	22	0,001
		6÷10	20	15,5±3,2	67	51,9±4,4	-5,1	0,956		
		11÷15	42	32,6±4,1	41	31,8±4,1	+0,1	0,000		
		15÷20	45	34,9±4,2	15	11,6±2,8	+4,7	0,555		
		>20	20	15,5±3,2	3	2,3±1,3	+8,2	0,543		
			129	100,0	129	100,0	-	2,061		
4	( )	0,6	6	4,7±1,9	9	7,0±2,2	-2,0	0,020	9	0,001
		0,7÷1,6	71	55,0±4,4	102	79,1±3,6	-1,5	0,189		
		1,7÷2,5	42	32,6±4,1	17	13,2±3,0	+3,9	0,381		
		2,6	10	7,8±2,4	1	0,8±0,8	+10	0,349		
			129	100,0	129	100,0	-	0,939		
5	-	1,0	13	10,1±2,7	21	16,3±3,3	-2,0	0,065	8	0,001
		1,1÷2,0	86	66,7±4,2	103	79,8±3,5	-0,8	0,052		
		2,1÷3,0	30	23,3±3,7	5	3,9±1,7	+7,8	0,754		
			129	100,0	129	100,0	-	0,870		

; -  
 ( ), 2 -  
 ( , , ) ,  
 ( 5),  
 (6÷10)  
 ( - (51,9±4,4)%, - (15,5±3,2)%, 0,05).

(15÷20) . , (11,6±2,8)%  
 15-20 , 4 . ( (11,6±2,8)%  
 (34,9±4,2)%, 0,05); , ( - . - (27,0±5,6)%, -  
 . - (42,4±6,1)%, 0,05).  
 20 ; 7  
 ( - . ( ) , -  
 - . ( (9,5±3,7)% (21,2±5,0)%, 0,05).  
 ;  
 : , (±r<sub>xy</sub>) ±0,7,  
 ,  
 ( , 2)  
 [8] ( )  
 . ( ) ;  
 ,  
 ) , ( )  
 .  
 2

-			
( - , )	60	-3,1	
	59÷50	-0,3	
	49÷40	+6,4	
	39	+4,7	
( )	0,0-1,0	-8,5	
	1,1÷2,0	-2,0	
	2,1÷3,0	0	
	3,1÷4,0	+12,0	
( , , , )	5	-1,7	
	6÷10	-5,1	
	11÷15	+0,1	
	15÷20	+4,7	
	>20	+8,2	
	0,6	-2,0	
	0,7÷1,6	-1,5	

( )	1,7÷2,5	+3,9
	2,6	+10
—	1,0	-2,0
	1,1÷2,0	-0,8
	2,1÷3,0	+7,8

:
,
(- 13
+13),
;

-13,0	-13,0> <+13,0	+13,0

--

.1.
( .2)
:
(
, =2,770 )
( =2,510 ),
( =2,061 )
( . .2).
,
,
,
.
,
:
, 38
-
35
( =+4,7),
«
» (
,
6 )
4,0 ( =+12,0).
( =+4,7+12,0 > +13),
,
.
(
,
),
.
.

1. , -
2. , -  
( ): 40 , 3,0 15 .
3. -  
, 95,0%, - 80,0% , -
1. -  
/ . . // . 2003. — 4. — . 34-39
2. -  
/ . . // . - 1999. -
2. — . 1-4
3. -  
/ . . // . - 2000. - 4 (20). - . 16-18
4. -  
? / . // Dental Tribune. - 2010. -
- 9, 2. — . 5-7
5. -  
/ . . , . . - 2005. - 4-5. - . 24-28
6. -  
/ . . // . 2004. — 4. — . 35-37
7. -  
/ . . , . . , . . - 2008. - 420 .
8. -  
, 1992.-213 .
9. / . .  
. — . : , 1983. — . 2. — . 113-163
10. -  
:
- . 14.01.02 —«  
» / . . . — , 1999. — 33
11. // .  
. // . - 1998. — . 4, 4. — . 24-26



UDC: 616.314.17-008.1:616-001.34]-036-092-084-08

**CLINICAL INFORMATION CONTENT OF DENTAL STATUS AND STATIFICATION  
OF PERIODONTAL ABNORMALITY DEVELOPMENT RISK IN SUBJECTS EXPOSED  
TO OCCUPATIONAL VIBRATION**

**I. I. Sokolova, M. A. Kashaba**

**Kharkiv National Medical University Ministry of Health of Ukraine**

**Summary.** Dental status was assessed in subjects exposed to occupational vibration and it was proved that its indices are characterized by different clinical information content and prognostic value. In order to stratify the risk of periodontal abnormality development we have elaborated a prognostic algorithm which registers the most informative indices, among them (in rank sequence of mixed information content): a decrease in local vacuum-pressure resistance of capillaries less than 40 seconds, the value of periodontal treatment needs index more than 3,0 b and the value of caries intensity more than 15 un. Clinical validation of the algorithm determined that its sensitivity comprised 95,0% and specificity amounted not less than 80,0%.

**Keywords:** periodontal abnormality, vibration disease, risk stratification.

**CLINICAL INFORMATION CONTENT OF DENTAL STATUS AND STATIFICATION  
OF PERIODONTAL ABNORMALITY DEVELOPMENT RISK IN SUBJECTS EXPOSED  
TO OCCUPATIONAL VIBRATION**

**I. I. Sokolova, M. A. Kashaba**



## Kharkiv National Medical University Ministry of Health of Ukraine

**The aim of the research** was to elaborate a technique for individual prognosis of periodontal diseases among persons with occupational exposure to vibration.

**Materials and methods of the research.** Examination of dental status (DS) was performed in the patients of both groups which were formed by copy-pair method: the first group ( $n_0=129$ ) comprised subjects exposed to occupational vibration, who underwent comprehensive medical examination and its results all aimed to exclude vibration disease (VD); the second group ( $n_1=129$ ) comprised patients with VD, who underwent treatment at the specialized department of research and development institute of occupational hygiene and diseases at Kharkov National Medical University of Ministry of Health of Ukraine (the first subgroup -  $^1n_1=63$  patients with VD stage and the second group -  $^2n_1=66$  patients with stage ).

DS assessment was performed by the method of K. M. Kosenko (pat. 57512, Ukraine) among in-patients and control group subjects (during comprehensive medical examinations) with the employment of: Papillary-Marginal-Alveolar Index (PMA), Simplified Oral Hygiene Index ( -S), caries intensity (caries/filling/extraction index), with evaluation of vacuum-pressure resistance of gingival capillaries (by the method of V.I. Kulazhenko) and Community Periodontal Index of Treatment Needs (CPITN). Initial data were statistically processed with evidence determination by paired t-test.

**Results of the research and their discussion.** Taking into account possible pathogenic similarity of mechanisms which form microcirculatory injuries in periodontal diseases and VD, we investigated vacuum-pressure local resistance of gingival capillaries both among the patients of the control group and among the patients with VD according to its severity. It was found that only in  $(65,9 \pm 4,2)\%$  patients of the control group and in evidently  $(0,05)$  smaller proportion  $(26,4 \pm 3,9)\%$  of patients with VD the duration of vacuum test up to the formation of gingival hematoma corresponded to referential values (exceeded 60 s), at that: there were twice as less of such patients among patients with VD stage than in VD stage (correspondingly  $(18,2 \pm 4,7)\%$  and  $(34,9 \pm 6,0)\%$ ,  $0,05$ ), which allows us to employ this criterion as a differentiated diagnostic one in the system of comprehensive diagnostic of VD stage.

CPITN analysis according to the group of comparison determined that  $(31,0 \pm 4,1)\%$  of patients with VD (VD -  $(20,6 \pm 5,1)\%$ , VD -  $(40,9 \pm 6,1)\%$  of the examined subjects) and  $(1,6 \pm 1,1)\%$  of control group subjects,  $0,05$  require comprehensive therapy (including prosthodontic treatment).  $(35,7 \pm 4,2)\%$  of patients with VD and  $(36,4 \pm 4,2)\%$  of control group subjects require comprehensive therapy with open or closed curettage.

A technique of individual prognosis according to DS criteria was elaborated on the basis of examination of DS peculiarities, performed to form risk groups of periodontal diseases in subjects exposed to occupational vibration. The technique is based on the approach of sequential recognition procedure with the employment of prognosis charts with such prognosis signs as the most informative significant indices of DS in the examined subjects which we determined by the data of dispersion analysis as the most informative, reliable and pathognomonic ones.

Caries intensity analysis was carried out according to CFE index (caries, fillings, extracted teeth) and it showed that patients of the control group and patients with VD did not have differences according to minimal values of this index  $(\leq 5)$ ; that is, the proportion of subjects with minimal caries intensity was similar among patients of the comparison groups. Caries intensity within the values of CFE index  $(6 \div 10)$  un. Was observed evidently more frequent among the subjects of the control group (in the control -  $(51,9 \pm 4,4)\%$ , among patients with VD -  $(15,5 \pm 3,2)\%$ ,  $0,05$ ).

The most significant difference according to the proportion of patients with CFE index within  $(15 \div 20)$  un. was observed in the comparison groups. For instance,  $(11,6 \pm 2,8)\%$  of the examined subjects in the control group were found to have such index values, but there were practically four times as many cases of CFE index within 15-20 un. among VD patients (correspondingly  $(11,6 \pm 2,8)\%$  and  $(34,9 \pm 4,2)\%$ ,

$0,05$ ); at that, evident differences in caries intensity were detected according to VD stage (in VD stage -  $(27,0 \pm 5,6)\%$ , in VD stage -  $(42,4 \pm 6,1)\%$ ,  $0,05$ ). Distribution according to the proportion of subjects with CFE index over 20 un. is even more illustrative; such patients were diagnosed seven times more frequent-

ly among patients with VD (in comparison with the control) and, according to the stage of VD, their number prevailed in VD stage (correspondingly  $(9,5 \pm 3,7)\%$  and  $(21,2 \pm 5,0)\%$ ,  $p = 0,05$ ).

Dispersion analysis determined in dices for the prognosis chart; the chart included only in dependent recognition signs: if bonding strength ( $\pm r_{xy}$ ) between the factors exceeded  $\pm 0,7$ , one of the factors was excluded out of the prognosis signs list, even though both of the indices are informative. Employment of diagnostic chart allows to implement the prognosis technique by means of clearly defined algorithm. Pathometric algorithms (PA) of prognosis have arrange of advantages. Formal information form (FIF) was employed for prognosis; pathometric FIF can be also used for the formation of diagnostic activity group and for the formation of treatment-prophylactic activity groups, for the distribution into the groups of dynamic (dispensary) observation, differentiated by the degree of periodontal diseases development (formation) risk.

DS indices in the prognosis chartered is tributed in the sequence of their decreasing information content: the most informative (the first rank place,  $=2,770$  beat) is the index of local vacuum-pressure resistance of periodontal capillaries, the second rank place is occupied by the index of periodontal treatment needs ( $=2,510$  beat), the third rank belongs to the index point, which reflects the number of carious, filled and extracted teeth ( $=2,061$  beat) and other factors. Corresponding prognostic coefficients have been calculated according to the ranking of each informative index, which gives a possibility to assess the risk of periodontal abnormality development in each individual dental examination of a certain subject exposed to occupational vibration by adding them consistently.

### **Conclusions.**

1. We have investigated the indices of dental status in subjects exposed to occupational vibration, which are characterized by different clinical information content and prognostic value.

2. In order to stratify the risk of periodontal diseases development we have elaborated prognostical go rithm which registers the most informative indices, among them (in the sequence of decreasing information content): a decrease in local vacuum-pressure resistance of capillaries less than 40 seconds, the value of periodontal treatment needs index more than 3,0 band the value of caries intensity more than 15 un.

3. Clinical validation of the algorithm for periodontal diseases risk stratification in subjects exposed to occupational vibration determined that its sensitivity comprised 95,0% and specificity amounted not less than 80,0%

Further investigation of these issues is connected with the study of clinical, metabolic and immunologic peculiarities of patients with periodontal abnormalities exposed to occupational vibration.

**Summary.** Dental status was assessed in subjects exposed to occupational vibration and it was proved that its indices are characterized by different clinical information content and prognostic value. In order to stratify the risk of periodontal abnormality development we have elaborated a prognostic algorithm which registers the most informative indices, among them (in rank sequence of mixed information content): a decrease in local vacuum-pressure resistance of capillaries less than 40 seconds, the value of periodontal treatment needs index more than 3,0 b and the value of caries intensity more than 15 un. Clinical validation of the algorithm determined that its sensitivity comprised 95,0% and specificity amounted not less than 80,0%.

**Keywords:** periodontal abnormality, vibration disease, risk stratification.