



ISSN: 2277- 7695

TPI 2015; 3(12): 64-67

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www.thepharmajournal.com

Received: 15-01-2015

Accepted: 26-01-2015

Mihaylenko T.M.

The Chair of Dentistry, Institute
Of the Postgraduate Study, Ivano-
Frankivsk National Medical
University, Ivano-Frankivsk city,
Ukraine.

Oral cavity hygiene in persons using adhesive products to improve the fixation of removable dentures constructions

Mihaylenko T.M.**Abstract**

This article gives the results of studying oral cavity hygiene in patients with removable dentures, using adhesive products to improving fixation.

To do this, use the integral indicator of oral hygiene (IIOH) and some physical parameters of oral fluid. In persons using adhesive products, (showed a an reliable increase on 53% of the medium value IIOH and medium values of the concentration of hydrogen ions (on 6%), the viscosity (on 44%), decrease in the rate of salivation (on 34%) were observed, in comparison by the analogical indexes in persons, not using such adhesive products. According to the results recommended: persons using the adhesive products and matter IIOH "good" and "satisfactory" - to appoint hygienic measures three times a year, and with values - "bad" and "very bad" - four times.

Keywords: removable dentures, the adhesive products, the status of hygiene, the concentration of hydrogen ions, viscosity, rate of salivation.

1. Introduction

Methods orthopedic treatment of partial and full dentition defects to improve fixation of removable dentures include the use of the adhesive products [1]. Number of people who, for various reasons, temporarily or permanently use various adhesives are growing. At the same time known about difficulties denture-bearing areas from their use: the emergence of prosthetic stomatitis, disbacteriosis of oral cavity [1, 2].

According to the scientific and medical literature watching the direct and indirect impact on the deterioration of the hygienic condition of the mouth, as due to the presence of additional retention activities and infringement of rheological characteristics of oral fluid [3,4]. Such factors as the concentration of hydrogen ions, viscosity, salivation rate, scientists use as an express-estimation of assessing the influence of adhesive means on the status of dentition and recommend ways to normalize it [5, 6].

These studies are essential to prevent complications from side of tissues of prosthetic denture-bearing areas arising in patients with removable dentures in violation of hygienic oral care. The purpose of our work was to study the status of oral cavity hygiene in patients with removable denture constructions, using adhesive means, based on clinical and laboratory parameters.

2. Materials and methods

In dental clinic of The **Chair of Graduate Studies** we examined 85 persons that use removable dentures constructions. Among them, 50 people did not use the tools to improve fixation, and it was first group, and 35 people used the tools to improve fixation and formed second group. Studies are presented in Table 1.

Table 1: Characteristics of the study groups, %

Groups	Sex		Terms of use removable dentures			Types of removable dentures	
	Men	Women	By year	From year to three	More than three	Partial	Complete
I	36 (18)	64 (32)	42 (21)	42 (21)	16 (8)	38 (30)	62 (49)
II	49 (17)	51 (18)	17 (6)	69 (24)	14 (5)	35 (20)	65 (37)

Correspondence:**Mihaylenko T.M.**

The Chair of Dentistry, Institute
Of the Postgraduate Study,
Ivano-Frankivsk National
Medical University, Ivano-
Frankivsk city, Ukraine.

In all the determined state of oral hygiene using medical-diagnostic computer programs "The integral indicator of oral hygiene in patients with removable dentures constructions" [7]. Index graduations are: "good" (25,7), "satisfactory" (25,7-44,0), "bad" (44,1 - 75,0), "very bad" (75,1 - 100).

Also, all persons carried diagnostics rheological characteristics of oral fluid viscosity, which included the rate of salivation, the concentration of hydrogen ions. Oral fluid viscosity was determined using standard micropipettes by the method of Ryedinova T. L. [8]. The rate of salivation was calculated in ml/min, using the formula: number of allocated saliva / saliva collection time [9]. The concentration of hydrogen ions - laboratory, using a pH meter pH millivoltmeters 410 "NPKF Akvilon" (Russia).

The results were subjected to statistical analysis by variation statistics. Level of reliability of difference of group average indexes was determined by the Student's method and χ^2 -

criterion for unrelated samples. The reliability of obtained results was determined at $P \leq 0,05$.

3. Results and discussion

The results of clinical and laboratory testing of persons who use removable dentures structures and means to improve adhesive fixation presented: the percent distribution of persons by IIOH values, the average value of the index IIOH according to the terms of use, average values of physical parameters in oral fluid test and study groups statements using χ^2 -test.

On the basis of percentage distribution of persons by values of IIOH found that in second group were more patients with values IIOH "bad" - (57)% (20), and in the first with the values of "satisfactory" - (48)% (24). The smallest number of persons in the first group had values IIOH - "very bad" - 4% (2), and in the second group - "good" - 9% (3), (Fig. 1).

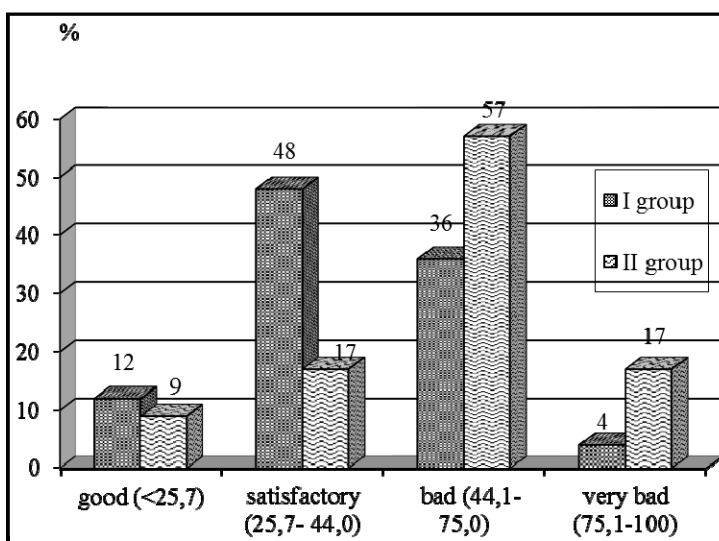


Fig 1: Distribution persons for values IIOH.

According to the fact that a higher percentage of persons in II group had values IIOH "bad" and "very bad" in accordance 57% and 17%, and in I group surveyed with these index values were significantly lower, in accordance - 36% and 4%, installed deterioration of oral hygiene persons with removable

dentures designs that are intermediaries of adhesion ($P \leq 0,05$). The same trend can be traced by average values of index IIOH, so in the II group it is $(60,86 \pm 3,55)$ c.u., which is 53% more than in the first $(39,68 \pm 2,1)$ cu. when $P \leq 0,05$ (Fig. 2).

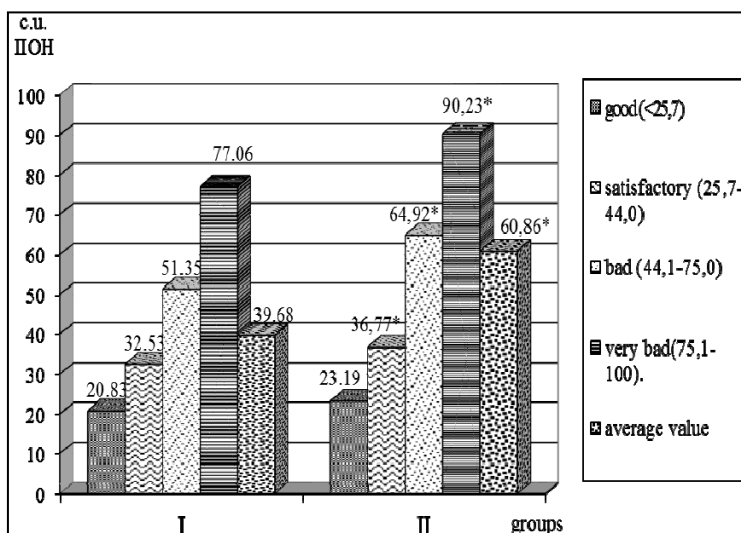


Fig 2: Distribution of persons by the average values of index IIOH

Increase of the mean values IIOH in patients of II group observe all shades of the index, except "good". So between persons in I and II group a significant difference was: the index value "satisfactory" 13%, respectively ($36,77 \pm 0,91$) c.u. and ($32,53 \pm 1,02$); meaning "bad" - 26%, respectively ($64,92 \pm 2,08$) c.u. and ($51,35 \pm 2,23$) c.u.; meaning "very bad" - 17%, respectively ($90,23 \pm 1,45$) c.u. and ($77,06 \pm 6,64$).

Thus, we can establish not only an increase in the number of individuals with improper hygienic oral care, but also the average values of the index IIOH in persons from the second group with values "bad" and "very bad". We analyzed the average values IIOH in groups according to the terms of use (Fig. 3).

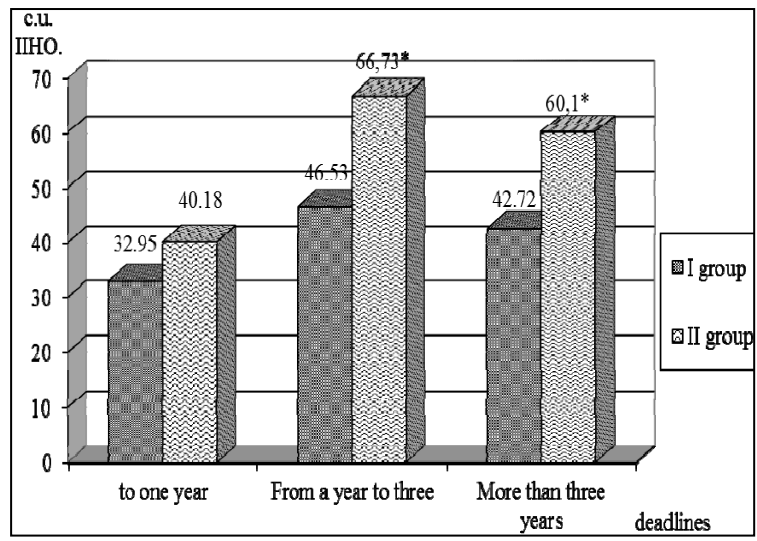


Fig 3: Distribution of persons by average values of index IIOH according to the terms of use. Note: * - significant differences in indicators in I and II group ($P \leq 0,05$).

So, should be admitted, that in case of the use of removable dentures less than a year, we didn't found a significant difference in the indicators of the first and second groups: ($32,95 \pm 0,58$) c.u. and ($40,18 \pm 11,65$) c.u. respectively. With increasing period of use removable dentures are seeing a significant difference in the indicators IIOH in the II group of individuals with removable dentures from one to three years,

and more than three years the average index is 1.4 times higher than in group I, respectively - ($66,73 \pm 3,64$) c.u. and ($46,53 \pm 1,28$) c.u.; ($60,1 \pm 5,92$) c.u. and ($42,72 \pm 0,77$) c.u. We traced the dynamics of changes of some physical factors that affect the state of oral hygiene in patients with removable dentures (Table 2).

Table 2: Physical indicators of oral fluid in the study groups ($M \pm m$)

Value IIOH	pH (cu.)		Viscosity (cu.)		Salivation (ml / min)	
	I	II	I	II	I	II
«good»	$6,80 \pm 0,05$	$6,60 \pm 0,06$	$4,20 \pm 0,20$	$4,73 \pm 0,41$	$0,45 \pm 0,02$	$0,36 \pm 0,015^*$
"satisfactory"	$6,55 \pm 0,05$	$5,98 \pm 0,18^*$	$4,90 \pm 0,10$	$5,39 \pm 0,30^*$	$0,31 \pm 0,01$	$0,23 \pm 0,03^*$
"bad"	$6,40 \pm 0,07$	$6,19 \pm 0,08^*$	$5,72 \pm 0,56$	$6,96 \pm 0,69$	$0,25 \pm 0,02$	$0,19 \pm 0,01^*$
"very bad"	$6,0 \pm 0,001$	$6,01 \pm 0,11$	$7,65 \pm 0,35$	$12,77 \pm 1,16$	$0,24 \pm 0,16$	$0,13 \pm 0,015^*$
M±m	$6,50 \pm 0,04$	$6,16 \pm 0,064^*$, $\Delta_{I-II} - 6\%$	$5,22 \pm 0,23$	$7,49 \pm 0,74^*$, $\Delta_{I-II} - 44\%$	$0,30 \pm 0,01$	$0,20 \pm 0,013^*$, $\Delta_{I-II} 34\%$

Note: * - significant difference between the indicators in group I and II ($P \leq 0,05$); Δ - significant difference in percentage between the average values in group I and II

It should be noted that the indicators of hydrogen ions concentration and viscosity in persons I and II groups with the value IIOH "good" was not different among themselves, but persons in the II group had significantly lower salivation rate: ($0,36 \pm 0,015$) ml / min and ($0,45 \pm 0,02$) ml / min in the I group. Patients using adhesive means to improve fixation of dentures with the value IIOH "satisfactory" significantly lower than in the I group were pH and rate of salivation ($5,98 \pm 0,18$) c.u. and ($6,55 \pm 0,05$) c.u.; ($0,23 \pm 0,03$) ml / min and ($0,31 \pm$

$0,01$) ml / min, and significantly higher - viscosity indices - ($5,39 \pm 0,30$) c.u. and ($4,90 \pm 0,10$) c.u. In the same group with values IIOH "bad" compared with the results of I group observed a significant decline in pH and rate of salivation, in accordance: ($6,19 \pm 0,08$) c.u. and ($6,40 \pm 0,07$) c.u., ($0,19 \pm 0,01$) ml / min and ($0,25 \pm 0,02$) ml / min. In the II group persons with values IIOH "very bad" showed a significant decrease in the rate salivation, in accordance ($0,13 \pm 0,015$) ml / min, and the I group - ($0,24 \pm 0,16$) ml / min. Between all

means of indicators that were studied in both groups, we observed a significant difference. So, in the second group, compared with the first observed concentration of hydrogen ions shift in the direction acidosis 6% - ($6,16 \pm 0,064$) c.u. and ($6,50 \pm 0,04$) c.u, decrease in the rate salivation by 34% - ($0,20 \pm 0,013$) ml / min and ($0,30 \pm 0,01$) ml / min and the growth rate of oral fluid viscosity at 44% - ($7,49 \pm 0,74$) c.u. against ($5,22 \pm 0,23$) c.u.

4. Conclusions

1. Our study showed that the use of adhesive means for fixation improvement of removable dentures is a risk factor for deterioration of oral hygiene in these patients.
2. We observed an increase in the percentages of persons with values ПОН "bad" and "very bad" - 57% and 17%, and 53% of average values ПОН index ($60,86 \pm 3,55$) c.u, in group of patients using adhesive means to improve the fixation of removable dentures, compared with those who didn't use any means, respectively - 36% and 4%, ($39,68 \pm 2,10$) c.u.
3. Determination of some physical characteristics of oral fluid were confirmed by clinical examination and show a significant increase in average values of the concentration of hydrogen ions (6%), viscosity (44%) reduction of salivation rate (34%) in the group of persons using adhesive means to improve dentures fixation, comparing with a group of people who did not use them. Also, in patients with adhesive intermediaries of all gradations of Index - ПОН significant reduction of salivation rate was observed.
4. Considering the results of our clinical and laboratory research in order to ensure proper hygienic condition of the oral cavity, we recommend – for those persons using adhesive means to improve dentures fixation and state of hygiene measures at ПОН as "good" and "satisfactory".

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