CLINICO-STATISTICAL STUDY ON EDENTULOUS SPACES EVOLUTION IN DRUG CONSUMING PATIENTS

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Abstract

Drug consuming patients are cases that require a specific approach in prosthetic treatment, due to the high susceptibility to dental affections and, therefore, the increased risk of losing their teeth. Aim: to determine a correlation between the number of edentulous spaces and the drug-consuming patients' compliance to dental treatment. Material and method: 35 drug consuming patients were treated for two and a half years. The degree in following the agreed treatment plan and in respecting the hygiene instructions was registered. The recorded data was analyzed using statistical methods (SPSS, Student's T test, ANOVA), corresponding to each category – uniformly distributed data versus data that procures statistical variations. Using T test, the hypothesis that the number of edentulous spaces is not significantly influenced by the time span of using drugs was tested. Results: The bivariate correlation between the number of edentulous spaces and the time span of using drugs (months) resulted in a Pearson correlation coefficient of 0.446 (positive, middle) and a statistical probability p-stat=0.007. Between the two factors there is a moderate positive and statistically significant linear correlation. The type of drug used does not determine significant differences regarding the number of edentulous spaces (P 0.140). The bivariate correlation between the number of edentulous spaces and the time passed from the last appointment showed that they are weak positive and not statistically significant correlated. Applying the regression model, only 9% of the variation of the number of edentulous spaces appeared in time. F-stat value was 3.2 and p-stat was >0.05, which certifies the fact that the time passed from the last appointment is not significantly influencing the number of edentulous spaces. Conclusions: This clinico-statistical study demonstrated the cause-effect relationship between the consumption of drugs and oro-dental changes (edentulous spaces). This data is useful in elaborating, accepting and executing a treatment plan.

Key words: drug-consuming patients, edentulous spaces, particular needs, compliance to dental treatment

Introduction

Drug consuming patients can be included in the clinical cases presenting particular needs and a specific approach in prosthetic treatment due to the susceptibility to dental affections and therefore to the increased risk of losing their teeth. The aim of this study is to determine a correlation between the number of edentulous spaces and their behavior towards dental treatment. There is a cause-effect relation between the drug consumption and the dental affections, that implies modifications in the developing process of the prosthetic treatment plan, taking into consideration the periods that the patients are not presenting themselves to the appointments for dental treatment due to the effects of drug consumption. This observation was sustained and completed by studies in literature that quantify the loss of a large number of teeth and the necessity of extraction for a lot of nonrecoverable ones, in case of opioid consumption[1]. In a study about case management and dental treatment in situations of substance abuse, it is mentioned the fact that the risks of developing dental caries, loss of teeth and periodontal diseases have high rates, because the drug consuming patients are suffering from xerostomia and are presenting a high rate of severe dental carious lesions due to a precarious oral hygiene[2]. A five years evaluation of dental care delivery system for drug addicts in Denmark observes the fact that the drug consuming patients are exposed to oral-facial trauma like dental fractures or dental avulsions due to accidents or fighting[3].

Material and method

This clinico-statistical pilot study was conducted between 01.03.2014 and 01.06.2016 on 35 patients treated in the university clinic of UMF "Carol Davila", department of Removable Prosthodontics, and in ARDS private clinic. The inclusion criteria were the following:

- Drug consuming patients or in treatment for rehabilitation
- Patients having a low to moderate level of phobia or anxiety
- Patients manifesting interest for dental treatment
- Patients that can afford the costs of dental treatment

The exclusion criteria were the following:

- Patients with decompensated general conditions
- Patients with high levels of anxiety or non-compliant
- Pregnant or breast-feeding patients
- Patients financially unable to go through the complementary needed investigations.

A rigorous anamnesis, intraoral photos, panoramic and periapical radiographs, CBCT images and documentary models were executed. For registering their edentulous state situation, Kennedy-Applegate classification was used. The degree of following the agreed treatment plan and respecting the instructions was also registered. Oral hygiene instructions were customized. Post-treatment photos were taken for patients that finalized the prosthetic treatment. The recorded data was analyzed using statistical methods (SPSS, Student's T test, ANOVA), corresponding to each category – uniformly distributed data versus data that procures statistical variations. Using T test, the hypothesis which assumes that the number of edentulous spaces is not significantly influenced by the time span of using drugs was tested.

Results

The number and frequency of the edentulous spaces was evaluated using Kennedy-Applegate classification and is presented in Table 1.

Table 1 Number and frequency of edentulous spaces

	Frequency	Percent	Valid percent	Cumulative percent
4	11	31.4	31.4	31.4
3	8	22.9	22.9	54.3
5	8	22.9	22.9	77.1
2	5	14.3	14.3	91.4
0	1	2.9	2.9	94.3
1	1	2.9	2.9	97.1
6	1	2.9	2.9	100.0
Total	35	100.0	100.0	

Using the T test, the hypothesis that the number of edentulous spaces is not significantly influenced by the time span of drug consuming was tested (Table 2, 3).

Table 2 Group Statistics

	Time span of drug consuming (years)	N	Mean	Standard deviation	Standard error mean

Number of edentulous spaces	<=4 years	11	2.64	1.362	.411
	>4 years	24	4.00	1.063	.217

Table 3 Testing the significative differences depending on the time span of drug consuming

Independent Sample Test

		Levene's Test for Equality of Variances		T Test for equality of means						
		F	**P-statistic**	t	df	P-statistic (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Number of edentulous spaces	Equal variances assumed	1.259	.270	-3.223	33	**0.003**	-1.364	.423	-2.224	-.503
	Equal variances non-assumed			-2.936	15.831	**0.010**	-1.364	.464	-2.349	-.378

Table 4 is showing the Pearson correlation coefficient which has a value of 0.446 (moderate positive) and p-stat which has a value of 0.007.

Table 4 The bivariate correlation between the number of edentulous spaces and the time span of drug consuming

		Number of edentulous spaces	Time span of drug consuming (month)
Number of edentulous spaces	Pearson Correlation	1	**0.446**[**]
	P-statistic (2-tailed)		**0.007**

	N	35	35
Time span of drug consuming (month)	Pearson Correlation	.446**	1
	P-statistic (2-tailed)	.007	
	N	35	35

**Correlation is significant at 0.01 (2-tailed).

The conclusion is that between the two factors, the number of edentulous spaces and the time span of drug consuming, there is a linear moderate positive correlation, which is statistically significant.

Table 5 Oneway ANOVA: testing the mean differences of the number of edentulous spaces depending on the type of drug used.

Descriptives

Number of edentulous spaces

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Injectable	2	4.00	1.414	1.000	-8.71	16.71	3	5
Uninjectable	13	3.00	1.732	.480	1.95	4.05	0	6
Both	20	3.90	.852	.191	3.50	4.30	2	5
Total	35	3.57	1.313	.222	3.12	4.02	0	6

Table 6 ANOVA (Analysis of Variance)

ANOVA

Number of edentulous spaces

	Sum of Squares	df	Mean Square	F	P-statistic
Between Groups	6.771	2	3.386	2.092	0.140
Within Groups	51.800	32	1.619		
Total	58.571	34			

After applying the ANOVA test (Tables 5,6), the conclusion is that the type of drug used, as way of administration, is not determining significative differences regarding the medium number of edentulous spaces (Fig. 1).
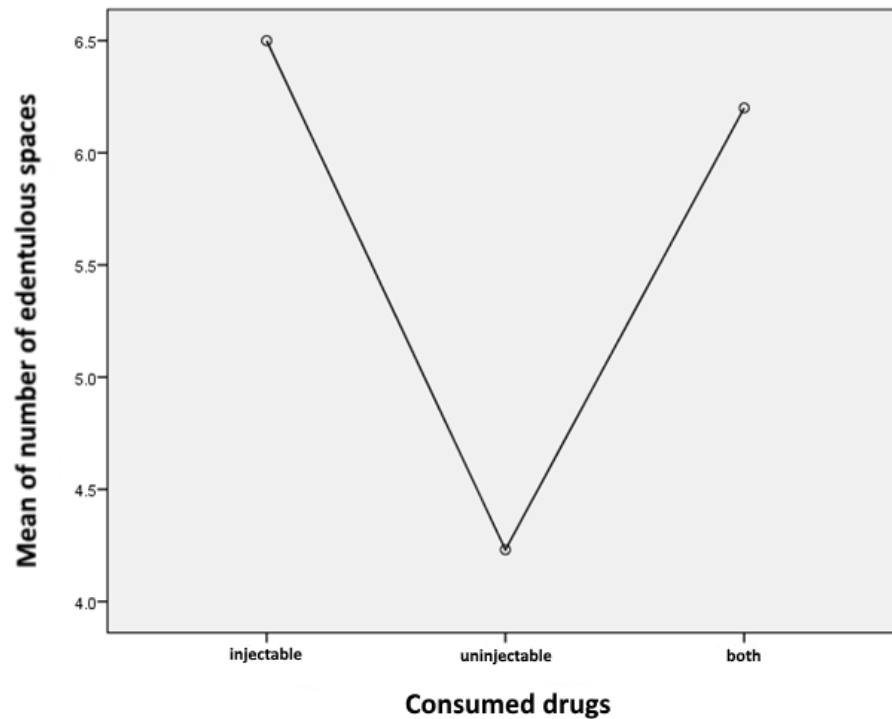

Figure 1 Graph-scatter plot

Table 7 The bivariate correlation between the number of edentulous spaces and the time passed from the last appointment

 Correlations

		Number of edentulous spaces	Time passed from the last appointment (month)
Number of edentulous spaces	Pearson Correlation	1	0.301
	P-statistic (2-tailed)		0.079
	N	35	35
Time passed from the last appointment (month)	Pearson Correlation	.301	1
	P-statistic (2-tailed)	.079	
	N	35	35

The number of edentulous spaces is low correlated, not statistically significant with the time passed from the last appointment (Table 7). Applying the regression model, only 9% from the number of edentulous spaces' variation appeared in time can be explained.

Table 8 ANOVA[a]

Model		Sum of squares	df	Mean squares	F	P-statistic
1	Regression	5.310	1	5.310	3.290	0.079[b]
	Residual	53.261	33	1.614		

Total	58.571	34

a. Dependent variable: number of edentulous spaces

b. Predictors: (Constant), last appointment (months)

The values of F-stat=3.2 and p-stat>0.05 (Table 8) are certifying that the time passed from the last appointment is not influencing the number of edentulous spaces in a statistically significant way.

Discussions

In a study about the oral effects of drug abuse, a generalized pattern of cervical dental caries for the opioid consuming patients was reported[4]. The same clinical situation, with a fast-evolving form of the dental caries regardless of the level of oral hygiene, in cases of heroin consumption, was observed in a study about the buccal-dental health of drug addicts treated in the University Hospital Center in Nice[5]. Another study on the etiology of xerostomia and dental caries among methamphetamine abusers[6], and also the American Dentists Association (ADA) Division of Communications[7], concluded that the methamphetamine consumers show forms of bruxism, high rates of tooth wear and fast evolving dental caries, forming the so called „meth-mouth". Injectable drugs are a greater risk factor, as it is sustained in a study on dental health in a group of drug addicts in Italy[8]. Same thing was observed in a report of two cases with necrotizing ulcerative gingivitis in drug addict patients being withdrawn from drugs[9], presenting generalized forms of periodontal disease.

Our results are certifying that the time passed from the last appointment is not influencing the number of edentulous spaces in a statistically significant way, which is also sustained by Robbins *et al.*[10] in their study related to oral health care needs and health care-seeking behavior among homeless injection drug users in San Francisco. This paper states the fact that these patients are difficult to communicate with, uncooperative and uncompliant to dental treatment, having also frequent problems in long-term follow-up procedures. In another study, regarding the oral health-related attitudes and behaviours of drug users, Robinson *et al.*[11] also observe a lack of interest and addressability to the dental care services for this category of patients. Drug consuming patients' choices regarding the prosthetic treatment are influenced by phycological and financial aspects. The economical factor is one of the reasons why most of these patients cannot sustain the costs of a complete oral rehabilitation plan[12,13]. The frequency with which the subjects declared that they accessed dental care services does not reveal a real responsibility and coherence in following the treatment sessions. In a study comparing drug users and non-drug users attending community pharmacies, dental health and access to dental treatment, Sheridan *et al.* also

mentioned the difficulty of accessing dental care services by the drug consuming patients[14]. Most often the reason of coming is the dental pain, but after it is solved, the completion of the treatment is postponed or not even taken into consideration. Because the prosthetic stage in a dental treatment plan most often succeeds the rest of the oral therapies that are needed, being made in a stabilized oral field, the majority of this patients abandon the treatment before this stage.

Conclusions

This clinico-statistical study demonstrated the cause-effect relationship between the consumption of drugs and oro-dental changes (edentulous spaces). This data is useful in elaborating, accepting and executing a treatment plan. The time elapsed from the last appointment for achieving dental care services is not significantly influencing the finalization of the treatment plan.

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