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The usefulness of Ramfjord teeth to represent the full-mouth pocket depth in epidemiological study

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Abstract

Partial recording of indices of periodontitis have long been used in clinical and epidemiological studies to predict full-mouth situation. The two most widely used partial recording indices for periodontal surveys are the community periodontal index of treatment needs (CPITN) and the Ramfjord teeth.

The aim of this study was to evaluate the usefulness of Ramfjord teeth in predicting the full-mouth periodontal status of an adult population in patient attending the collage of dentistry- Baghdad University.

The study participants were 240 patients we divide them into three main groups according to the age of the patients and each group were divided in to two sub groups according to the sex of the patients. Pocket depth was measured in millimeters with periodontal probe

The difference in the mean pocket depth measured from the full mouth(F) and Ramfjord teeth(R) by using paired t - test was non significant in all the groups. Also in all groups the correlation coefficient as well as beta coefficient was high

The high agreement between Ramfjord teeth and full mouth periodontal pocket depth confirm the epidemiological validity of Ramfjord teeth to represent the full mouth.

Key words: Ramfjord teeth, periodontal measure, CPITN.

Introduction

Partial recording of indices of periodontitis have long been used in clinical and epidemiological studies to predict full-mouth situation^(1,2). Studies have shown variations in the usefulness of recording indices of periodontitis in predicting whole-mouth periodontal status⁽³⁻⁵⁾. Data from whole-mouth examinations are the gold standard for accurate assessment of periodontal disease. Since periodontal destruction exhibits left-right symmetry, however, it is

hypothesized that a half-mouth exam provides an appropriate alternative to whole-mouth assessment, with considerable advantage over a more limited recording -mouth assessment of index teeth⁽⁶⁾. The two most widely used partial recording indices for periodontal surveys are the community periodontal index of treatment needs (CPITN) and the Ramfjord teeth⁽⁷⁾. The Ramfjord index has an advantage of involving six teeth instead of the ten CPITN teeth, potentially shortening the

examination time by almost half. Fleiss et al in 1987 found that the Ramfjord teeth are more than adequately representative of the rest of the dentition for epidemiologic studies of gingivitis, but are inadequate surrogates of the rest of the mouth for epidemiologic studies of periodontitis⁽⁸⁾. This study in our college to evaluate the usefulness of Ramfjord teeth in predicting the full mouth periodontal status.

Materials and methods

The study participants were 240 patients referred to the department of periodontics in college of dentistry, Baghdad University who came to receive full mouth periodontal examination and treatment plan. All the patients were suffered from chronic periodontitis which affect people mostly after the age of 30, the samples were divided into three main groups according to the age of the patients starting from 30 to 50 and older with a ten years interval in each group to see if there is any difference found between groups and each group were divided in to two sub groups according to the sex of the patients. The first group was between 30-40 years old, the 2nd group was between 40-50 years old, and the 3rd group was 50 and older. Pocket depth was measured in millimeters with periodontal probe with Williams markings from the base of the pockets to the free gingival margin; the mean pocket depth per tooth was calculated by summing the measurements per tooth and dividing by the number of measurements. Mean pocket depth for full mouth was calculated by summing the mean pocket depth per tooth and dividing by the number of the teeth. While the mean pocket depth for Ramfjord teeth was calculated by summing the mean pocket depth per tooth for the

Ramfjord teeth (teeth number: 16, 21, 24, 36, 41, 44) and dividing them by the number of the Ramfjord teeth, if the Ramfjord tooth was missing the case was ignored.

The statistical methods used in this study were a paired t-test to compare the difference in the mean pocket depth measured from the full mouth versus Ramfjord teeth stratifying by sex. We also conducted Pearson correlation coefficients between the mean pocket depths calculated from the full mouth measurement and from the Ramfjord teeth. We then conducted a linear regression analysis (β coefficient) with the full mouth mean as the out come variable and the Ramfjord teeth as independent variable

Results

The distribution of the sample were shown in table (1). The difference in the mean pocket depth measured from the full mouth(F) and Ramfjord teeth(R) by using paired t-test was non significant in all the groups as shown in table 2 the $p > 0.05$ non significant.

The correlation between the mean pocket depth calculated from the full mouth and Ramfjord teeth was 0.76 and 0.86 for male and female in the first age group and was 0.74 and 0.67 for male and female in the 2nd age group while it was 0.60 and 0.78 for male and female in the 3rd age group in the all previous groups the correlation coefficient were high as shown in the table 3.

We then conducted a linear regression analysis with the full mouth mean as the out come variable and the Ramfjord teeth mean as the independents variable in each group the β coefficient for the mean pocket depth measured by Ramfjord teeth to predict the full mouth was ranged between 0.42 and 0.89 the result was positive for the all groups which mean

it is a significant result as shown in table (4).

Discussion

The study based on pocket depth measurement in different age groups in patients have chronic periodontitis, the results show non significant difference between Ramfjord teeth and full mouth teeth in the male and female in different age groups using paired t- test . Also show good correlation between Ramfjord teeth and full mouth in both male and female in different age groups. The beta coefficient was used to assess prediction of the full-mouth mean pocket depth by Ramfjord teeth were high and not altered by adjustment for the age and sex of the participants. This was in agreement with Mumghamba et al in 2004 they concluded that there is high agreement between Ramfjord teeth and full mouth⁽⁹⁾ but it was disagreement with Fleiss et al in 1987 found that the Ramfjord teeth are inadequate surrogates of the rest of the mouth for epidemiologic studies of periodontitis.⁽⁸⁾ Also these findings are consistent with those of Sicilia et al (1990) who found that average severity scores of periodontal disease are obtained more accurately with the six Ramfjord teeth than the CPITN index.⁽¹⁰⁾ the fact that only six teeth instead of ten teeth (in CPITN) or half the mouth does imply that more subjects can be examined making the index a better epidemiological tool in studies involving a large number of subjects in setting with low number of dental personnel⁽¹⁰⁾. Partial-mouth examinations with appropriate adjustment of Ramfjord index teeth data may be useful for assessing periodontal disease progression in longitudinal population studies of human periodontitis⁽¹¹⁾ so these results support the use of Ramfjord teeth

procedure, to conserve time, limit cost, and reduce patient and examiner fatigue while providing maximal clinical information. Ramfjord teeth assessment was not as suitable for evaluation of either disease extent or prevalence⁽⁶⁾.The high agreement between Ramfjord teeth and full mouth periodontal pocket depth confirm the epidemiological validity of Ramfjord teeth to represent the full mouth.

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Table (1) distribution of samples

	Group1 (30-40)				Group2 (40-50)				Group3 (50-60)			
	Male		Female		Male		Female		Male		Female	
	F	R	F	R	F	R	F	R	F	R	F	R
Mean	1.46	1.44	1.57	1.61	1.62	1.58	1.51	1.47	1.81	1.78	1.77	1.82
SD	0.41	0.35	0.40	0.57	0.55	0.51	0.32	0.51	0.57	0.62	0.27	0.38

Table (2) t-test between F&R of groups

Groups	sex	t-test	P-value	Sig
Group1 (30-40)	Male	0.16	0.87	NS
	Female	0.37	0.74	NS
Group2 (40-50)	Male	0.12	0.90	NS
	Female	0.45	0.66	NS
Group3 (50-60)	Male	0.26	0.80	NS
	Female	0.51	0.61	NS

*P>0.05 Non significant

Table (3) Correlation Coefficient F&R of group

Groups	sex	r
Group1 (30-40)	Male	0.761
	Female	0.868
Group2 (40-50)	Male	0.742
	Female	0.673
Group3 (50-60)	Male	0.606
	Female	0.786

Table (4) Linear regression F&R of groups

Groups	sex	β	Linear regression equation
Group1 (30-40)	Male	0.892	$\hat{Y}=0.170+0.892X$
	Female	0.606	$\hat{Y}=0.597+0.606X$
Group2 (40-50)	Male	0.790	$\hat{Y}=0.349+0.790X$
	Female	0.423	$\hat{Y}=0.897+0.423X$
Group3 (50-60)	Male	0.562	$\hat{Y}=0.815+0.562X$
	Female	0.547	$\hat{Y}=0.693+0.547X$