Short Communication

Dental Attrition and Associated Factors in Adolescents 14 to 19 Years of Age: A Pilot Study

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Purpose: This cross-sectional study evaluated the relationship between attrition and diverse variables in 390 Mexican adolescents aged 14 to 19 years. ***Materials and Methods:*** An ordinal scoring system was used to describe the severity of attrition. ***Results:*** Attrition prevalence was 33.3% and was associated with older age, presence of defective restorations, Class II malocclusion, and perception of stress level. ***Conclusion:*** Our results suggest that attrition is present in 1 of every 3 adolescents. *Int J Prosthodont 2005;18:516–519.*

The gradual wearing away of the tooth surface occurs in all individuals and can be classified as one of 4 types[1]: attrition, abrasion, erosion, or a poorly characterized phenomenon called abfraction.[2] These surface loss modalities have distinct etiologies, characteristics, and wear patterns.[2] In spite of the fact that many of these features and risk factors are especially relevant to adolescents' health, little information exists in Latin America about which factors (virtually all of them derived from the international literature) are relevant to the adolescents of the region. This study sought to determine the prevalence, severity, distribution, and factors associated with dental attrition in a sample of adolescents in Campeche, Mexico.

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Materials and Methods

This study used data from a previously published epidemiologic study of temporomandibular disorders.[3,4] A cross-sectional study was carried out in 390 adolescents, all of whom were 14 to 19 years of age. One of 4 calibrated and standardized examiners (kappa > 0.85) conducted each exam. Each tooth was assessed for wear using an ordinal scoring system that described the severity of attrition.[5] Subjects were classified according to the 2 most severely affected teeth:

- 0 = little or no enamel wear (occlusal/incisal morphology intact)
- 1 = marked wear facets of the enamel (occlusal/incisal morphology altered)
- 2 = wear into dentin (dentin exposed occlusally/incisally or on adjacent tooth surface; occlusal/incisal morphology changed in shape, with loss of crown height of the tooth)

Table 1a Distribution Characteristics of Subjects (Mean ± SD) Included in the Study

Variable	Without attrition mean ± SD; (median)	With attrition mean ± SD; (median)	*P* value
Age (in years)	15.62 ± 1.09; (15)	16.61 ± 1.40; (16)	.0000*
Mouth opening (in mm)	38.64 ± 7.67; (38)	41.11 ± 7.39; (42)	.0026†
Number of teeth lost	0.25 ± 0.74; (0)	0.35 ± 0.91; (0)	.3250*
Number of teeth filled	1.74 ± 2.97; (0)	2.78 ± 3.72; (1)	.0034*
Number of defective restorations	0.90 ± 2.10; (0)	1.30 ± 2.04; (0)	.0005*

*Mann-Whitney test; †Student *t* test.

Table 1b Distribution Characteristics of Subjects (n and %) Included in the Study

Variable	n (%)	n (%)	*P* value*
Sex			
Men	125 (69.8)	54 (30.2)	.222
Women	135 (64.0)	76 (36.0)	
Orthodontic treatment			
No	212 (65.2)	113 (34.8)	.179
Yes	48 (73.8)	17 (26.2)	
Malocclusion			
Class I	219 (67.0)	108 (33.0)	
Class II	20 (55.6)	16 (44.4)	.225
Class III	19 (76.0)	6 (24)	
Lifestyle			
1st, 2nd, 3rd quartile	196 (66.2)	100 (33.8)	.738
4th quartile	64 (68.1)	30 (31.9)	
Stress			
1st, 2nd, 3rd quartile	209 (71.2)	85 (28.9)	.001
4th quartile	51 (53.1)	45 (46.9)	
Anxiety			
1st, 2nd, 3rd quartile	204 (66.7)	102 (33.3)	1.000
4th quartile	56 (66.7)	28 (33.3)	
Pattern of bite			
Bilateral	144 (65.8)	75 (34.2)	.820
Unilateral	107 (66.8)	53 (33.1)	
Premature contact in working site			
No	125 (67.2)	61 (32.8)	.722
Yes	129 (65.5)	68 (34.5)	
Premature contact in balance site			
No	165 (71.7)	65 (28.3)	.006
Yes	89 (58.2)	64 (41.8)	

*Chi-square test.

- 3 = extensive wear into dentin (larger dentin area [> 2 mm^2] exposed occlusally/incisally or on adjacent tooth surface; occlusal/incisal morphology totally lost locally or generally; substantial loss of crown height)

The independent variables (the distributions are shown in Tables 1a and 1b) were: sex, age, stress, lifestyle, anxiety, Angle occlusion classification, size of mouth opening, number of teeth lost, number of teeth filled, number of defective restorations, orthodontic treatment, premature contacts in balance and work positions, and chewing pattern. We used questionnaires with Likert-type scale items (with established questionnaires described elsewhere) for the self-evaluation of stress, anxiety, and lifestyle.[4,6,7] We used a total of 14 items for anxiety and 44 items for stress, with total scores ranging from 0 (not anxious at all) to 56 (extremely anxious), and from 0 (not stressed at all) to 176 (extremely stressed). The instrument for lifestyle assessment included a numeric scale that ranged from 0 to 11, with 0 indicating a favorable lifestyle and 11 indicating an unfavorable lifestyle. Twenty items were used, with total scores ranging from 0 (favorable lifestyle) to 220 (unfavorable lifestyle). The distributions for these 3 variables were divided into quartiles.

Data were analyzed with parametric and nonparametric tests. A multivariable model of logistical re-

Table 2 Multivariate Logistic Regression Analysis Using Dental Attrition (0 = No Attrition, 1 = Any Attrition) as Dependent Variable

Variable	Coefficient	Adjusted OR	95% CI	*P* value*
Age (y)	0.5543	1.74	1.44–2.10	.001
Definitive restorations				
None		1*		
At least one	0.6232	1.86	1.14–3.05	.013
Malocclusion				
Class I and II				
Class III	0.2988	†		.515
Stress				
1st, 2nd, 3rd quartile				
4th quartile	0.3619	†		.190
Interaction‡	2.1787	†		.079

OR = odds ratio; CI = confidence interval.
*Reference category; †Interaction interpreted in the Results section; ‡Interaction between Class II malocclusion and stress.
Adjustment: Hosmer and Lemeshow Goodness-of-fit test: Chi-square(6) = 2.28; *P* = .8925.
Linear test for age (Box-Tidwell test): *P* = .211. Specifiation error test: predictor, *P* = .000. predictor^2, *P* = .892.

gression was fitted (Hosmer and Lemeshow goodness-of-fit test) to ascertain the simultaneous impact of the independent variables in STATA 7 (StataCorp).

Results

The mean age of the participants was 15.95 ± 1.29 years. The prevalence of attrition in the study population was 33.3%. With regard to severity, 29.2% of participants (n = 114) had attrition level 1, 3.6% (n = 14) had level 2, and 0.5% (n = 2) had level 3. Descriptions of the variables and bivariate analyses are shown in Tables 1a and 1b. The variables associated with dental attrition remaining in the final model (Table 2) were:

- Age: the likelihood of dental attrition increased 1.74 times with each year of increase in age.
- Presence of defective restorations (OR = 1.86).
- An interaction between malocclusion and perception of stress level. The effect of malocclusion Angle Class II had a distinct relationship with dental attrition in the groups with lower (OR = $\exp^{0.2988}$ = 1.35) and higher stress levels (OR = $\exp^{(0.2988 + 2.1787)}$ = 11.91).

The model adjustments were tested with the Hosmer-Lemeshow goodness-of-fit test and were not found to be significant in either model ($P > .10$), suggesting that the observed probabilities were similar to predicted probabilities. The specification error test was satisfactory. The variables included in the final model were a linear combination for the logit of outcome. Finally, we used the linear gradient test (Box-Tidwell test) to corroborate that the effect of age for the logit of outcome was linear with each change of one unit of age (Table 2).

Discussion

Our results suggest that attrition is fairly common—it is present in 1 out of every 3 adolescents—and are compatible with the findings of other studies. In this sample, attrition was associated with variables (age, the presence of defective restorations, and the effect of Class II malocclusion as modified by stress) that have been identified in prior non-Mexican study populations. This problem is complex and requires further investigation in this population.

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Literature Abstract

A clinical trial of patient satisfaction and prosthodontic needs with ball and bar attachments for implant-retained complete overdentures: Three-year results

The purpose of this 3-year randomized clinical trial of implant-retained mandibular complete dentures was to evaluate the change and duration of patient satisfaction, as well as the cost of denture maintenance. Different methods of attaching overdentures to implants and the use/nonuse of a reinforced framework were employed. One hundred subjects were recruited for the study, with each subject having at least 1 year's experience wearing complete dentures with no implants. Two implants were surgically placed in the anterior mandible. A new maxillary complete denture and implant-supported over-denture were fabricated for each subject. Subjects were then randomly placed into 2 treatment groups: (1) bar clip and (2) ball spring. These 2 groups were further subdivided into those with reinforcing framework and those without. The subjects indicated their overall satisfaction of their maxillary and mandibular dentures separately, using a visual analogue scale (VAS) ranging from 1 to 100, at 1 month, 1 year, and 2 years post delivery. Only 68 of the initial 100 totally edentulous patients were evaluated at 3 years post delivery. VAS scores for the 2 treatment groups were compared using a 2-sided nonparametric rank test and repeated measures ANOVA. A *t*-test was used to compare the group means for cost and maintenance. The mandibular implant-supported overdentures significantly improved satisfaction "within subjects", as compared to their satisfaction with their previous complete dentures. No notable satisfaction differences were found between the 2-attachment mechanisms or with the presence/absence of a reinforcing framework. The 2 treatment groups did not differ significantly between number of denture adjustments. Over the 3 years, the mean number of repairs per subject was statistically significantly greater in the ball spring group than the bar clip group. The utilization of cast framework had no influence on satisfaction, number of adjustments or repairs.

MacEntee MI, Walton JN, Glick N. *J Prosth Dent 2005*;93:28-37. **References:** 23. **Reprints:** Dr. Michael I. MacEntee, University of British Columbia, Faculty of Dentistry, 2199 Wesbrook Mall, Vancouver, BC, Canada V6T 1Z3; Email: macentee@interchange.ubc.ca—*Alvin G. Wee, Columbus, OH*