Prevalence and Severity of Dental Attrition among Patients Attending College of Dentistry / University of Baghdad

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Abstract

Background: Tooth attrition is the loss of tooth structure as an outcome of wear, and it can have an adverse effect on both oral and general condition. For establishing preventative and therapeutic strategies, it should understand the prevalence in a particular community.

Objective: To determine the prevalence and severity of dental attrition and any potential relationships between gender, age, with dental attrition.

Methods: Cross sectional study was accomplished at the Dentistry Teaching Hospital, University of Baghdad. The total sample of the study was 99 patients, including 29 males and 70 females, divided into three groups according to their age: young age (18–30), middle age (31–50), and old age people (above 50).

Results: The prevalence among 99 participants was 94.94% with the highest prevalence was among the middle and old age groups. Regarding gender, the male reported the highest prevalence (100%).

Conclusion: Tooth attrition was highly common among the population being considered; the higher attrition scores were among males than females and the attrition is significantly increased with age.

Keywords: Dental Attrition, Enamel exposure, grinding habits and bruxism

1. Introduction

The tooth wear is the loss of tooth substance persuaded by factors other than dental trauma, dental caries, or developmental disorders [1]. Generally, tooth wear is an irreversible condition not related to carious loss of tooth substance, mainly caused by tooth to tooth contact (attrition), contact with external substances (abrasion), and dissolving by acidic ingredients (erosion)and these conditions can be asymptomatic [2,3].

Tooth wear triggered by tooth to tooth contact is known as dental attrition. Too much wear and loss of tooth surface might be considered pathological and necessitate a dentist's intervention. Bruxism, or the clenching and grinding of teeth, can result in the pathological wear of the tooth surface [4,5]. A high level of attrition can cause the enamel to entirely wear away, exposing the dentin underneath. This increases the risk of dental cavities and dentine hypersensitivity. Musculoskeletal, craniofacial, and stomatognathic interrelationships are thought to be part of its

complex etiology [6].

Even while attrition is widespread in the elderly, many studies indicate that it is becoming more common among young people and children and is usually associated with bruxism. Young people's stress and anger have the potential to cause tooth attrition. Grinding habits, bruxism, holding objects between teeth, pipe smoking, and pencil/pen biting all accelerate attrition [7]. Since the patient's neurological urge for attrition cannot be cured by restorative treatment, clinical attrition management may provide difficulties. Therefore, it is essential that the patient understands the origins of this condition and is ready to spend a significant amount of time, possibly the remainder of their life, wearing a protective splint [8].

2. Materials and Methods

Cross sectional study was carried out at the Dentistry Teaching Hospital, University of Baghdad, from November 2024 to February 2025. Simple Random Sampling was conducted so that every patient who visited the dental hospital throughout the study period had an equal chance of being chosen. A total of 99 patients participated in the study, including 29 males and 70 females. Based on age, the sample was distributed into three groups: young age (18–30), middle age (31–50), and old age people (above 50). Extensive restoration, cast restoration, and patients who are below 18 years were excluded. Baseline data were obtained from clinical examination; their information was arranged in a table including age, gender, occupation, and presence of attrition, as summarized in Fig. 1.

Fig. 1 Case sheet for dental attrition.

The attrition index, which is adapted from Smith and Knight in 1984, is used to evaluate attrition [9], [10]. As indicated in Table 1, the degree of attrition was evaluated using a number of factors [11]. Once each tooth was scored separately, the attrition score was determined by dividing the total score of all the teeth examined to the total number of teeth, as shown in Figs. 2 to 6. Attrition Score Mean for each Patient= Sum of scores of all examined teeth/ Total Number of Teeth.

Table (1): Criteria of Attrition Assessment

| Score	Surface	Criteria
0	O/I	Intact enamel surface without any loss of tooth substance
1	O/I	Loss of enamel surface features
2	O	Loss of enamel of less than one third with exposing the dentin layer
	I	Loss of enamel with exposing dentin
3	O	Loss of enamel for more than one-third of the surface with exposing the dentin layer
	I	Loss of enamel with considerable loss of dentin without exposing pulp
4	O	Comprehensive loss of enamel, pulp exposure, with exposure of secondary dentin.
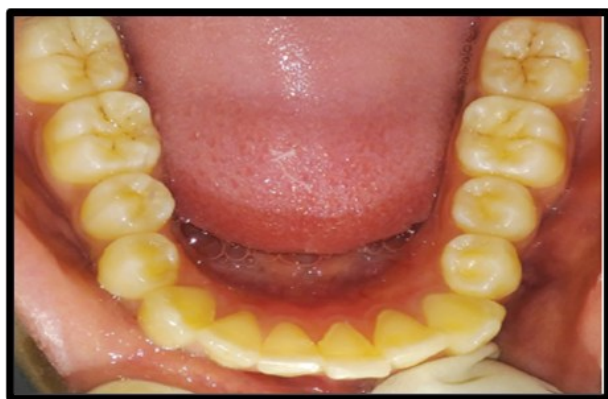
Fig. 2 No attrition of teeth in the mandible Score 0

Fig. 3 Presence of attrition Score 1 in Lower Central incisors

Fig. 4 Presence of attrition Score 2 in lower Central incisors

Fig. 5 Presence of attrition Score 2 in lower Central incisors and Score 3 in lower Right and Left molar teeth.

Fig. 6 Presence of Attrition Score 4 in lower anterior teeth.

SPSS Statistics was used to conduct the statistical analysis (version 28.0; Chicago, IL, USA). Data are displayed as percentages and frequencies. To examine categorical variables, the chi-square test was employed. Mann Whitney U test was used regarding the non-parametric data, and the outcomes were displayed as mean ranks. For further categorical comparisons, the Kruskal-Wallis test was employed. P values less than 0.05 were being considered statistically significant.

3. Results

99 people participated in the study; among them, 33 (33.3%) were young adults (18-30), 40 (40.4%) were middle-aged (31-50), and 26 (26.3%) were older adults (above 50). The sample comprised 29 males (29.29%) and 70 females (70.7%). The prevalence of dental attrition among 99 participants was 94.94%, as shown in Fig. 7.
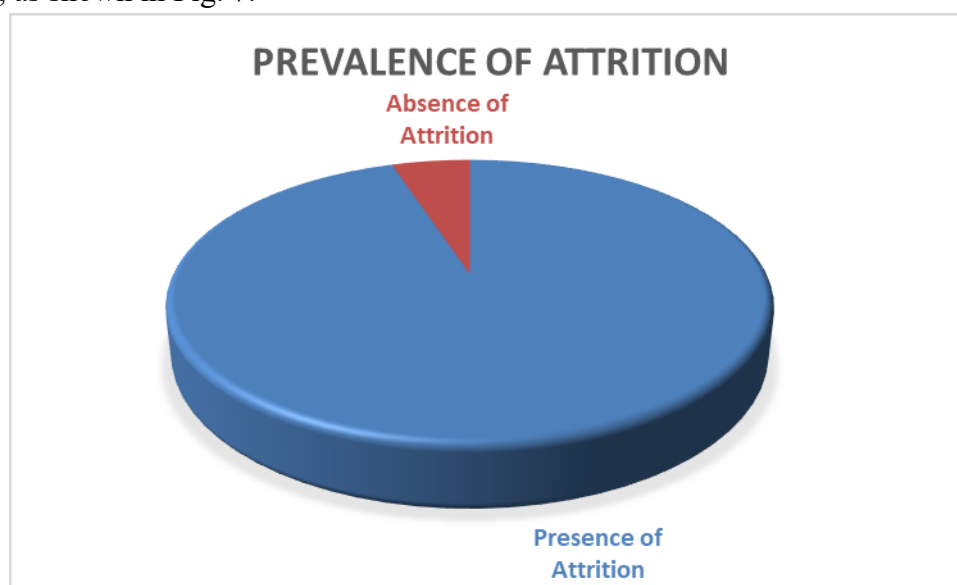
Fig. 7 Prevalence of Attrition among participants

Table 2 illustrates the prevalence of attrition according to different age groups. The highest prevalence was observed in both the middle-aged (31–50 years) and old-aged (above 50 years) groups, with 100% of participants exhibiting attrition. In contrast, the young-aged group (18–30 years) had a slightly lower prevalence of 84.84% (28 out of 33 participants). The chi-square test ($\chi^2 = 10.53$, $p = 0.0052$). Since the p-value was below 0.05, the result was considered statistically significant.

Table 2: Attrition Prevalence according to age group

Age Group	Patient No.	Attrition Present	
Young Age (18-30)	28/33	84.84%	
Middle Age (31-50)	40/40	100%	Chi-Square= 10.53 p=0.0052
Old Age (above 50)	26/26	100%	
Total	94/99	94.94%	

Table 3 demonstrates the prevalence of attrition according to gender. The Prevalence among the males was the highest, with 100% of participants presenting with attrition, while the females showed a lower prevalence with 92%. The chi-square test ($\chi^2 = 0.95$, $p = 0.33$). The result was not significant since the p-value was more than 0.05.

Table 3: Attrition Prevalence according to Gender

Gender	Patient No.	Attrition Present	Attrition Present	
Male	29	29	100%	Chi-Square= 0.95 p=0.33 Ns
Female	70	65	92%	
Total	99	94		

Table 4 demonstrates the distribution of attrition scores according to age groups: young age (18-30), middle age (31-50), and old age (above 50), which shows an increasing trend of attrition severity with increasing age. The mean of the score among the young age group was (0.48 ± 0.30), while the middle-aged group was recorded with a higher mean score of (0.93 ± 0.57). The highest mean attrition score was detected in the older age group with (1.77 ± 1.03). Using the Kruskal-Wallis test (H = 34.77, p = 0.0001), the result was statistically significant between the three age groups. Moreover, the mean rank values among the 3 age groups were 29.06, 52.39 and, 72.90, respectively.

Table 4: Attrition Severity Score Based on Different Age Groups

Age Groups	N	Mean	Std. Deviation	Mean Rank	
Young Age (18-30)	33	0.48	0.30	29.06	Kruskal-Wallis= 34.77 p=0.0001**
Middle Age (31-50)	40	0.93	0.57	52.39	
Old Age (Above 50)	26	1.77	1.03	72.90	

Table 5 demonstrates the crosstabulation of attrition severity, which shows a substantial relation between age groups and attrition scores with the chi-square value of 50.77 (P = 0.0001). The lower attrition scores, with 69.7% scoring less than 0.5, were recorded among younger patients, and no patient in the young age group had scores above 1.5. A more diverse distribution of scores among middle-aged patients, with (57.5%) between 0.5–1, but a noticeable percentage also scoring above. A higher attrition score, with 26.9% having more than 2.5 among the oldest group, while only 15.4% of patients were recorded as less than 0.5.

Table 5: Cross-tabulation of attrition severity scores by Age Groups

	Attrition Groups * Age groups Crosstabulation					
	Age groups					
Attrition Groups	Young Age		Middle Age		Old Age	
	N	%	N	%	N	%
less than 0.5	23	69.7%	8	20.0%	4	15.4%
0.51-1	9	27.3%	23	57.5%	6	23.1%
1.1-1.5	1	3.0%	3	7.5%	2	7.7%
1.51-2	0	0.0%	5	12.5%	5	19.2%
2.1-2.5	0	0.0%	0	0.0%	2	7.7%
Greater than 2.5	0	0.0%	1	2.5%	7	26.9%
Total	33	100.0%	40	100.0%	26	100.0%
	Chi-Square=50.77 p=0.0001**					

The analysis of attrition scores by gender showed that males had a higher mean attrition score (M = 1.20, SD = 0.88) compared to females (M = 0.91, SD = 0.79). A was employed to evaluate the statistical significance of this difference. The result of the Mann-Whitney U test revealed that the mean rank among males was higher (58.41) than that for females (46.51), suggesting a trend toward higher attrition scores in males. However, the test yielded Z = -1.89, P = 0.059, which exceeds the conventional significance threshold of 0.05. Therefore, while males exhibited higher attrition scores than females, the difference was not statistically significant, as shown in Table 6.

Table 6: Attrition Severity Score Values Based on Gender

Gender	Attrition Score Value				
	N	Mean	Std. Deviation	Mean Rank	Mann-Whitney U test
Male	29	1.20	0.88	58.41	Z= -1.89 P=0.059 NS
Female	70	0.91	0.79	46.51	

4. Discussion

The aim of this study was to identify the prevalence and severity of dental attrition among patients enrolled in the University of Baghdad/ College of Dentistry. Attrition was most common among middle-aged (31–50 years) and older persons (above 50 years), while it was slightly less common among younger participants (18–30 years) (28 out of 33). These results are correlated with a study by Thippanna et al. that observed that younger participants had a little lower attrition prevalence, while middle-aged and older participants had greater rates [11]. According to a previous study, attrition occurs in younger people aged between 18 and 40 but with less severity, and this could be explained by the human teeth wearing naturally with age because of the time of using their teeth in chewing and by habits or any other functional activity [1].

The study showed more attrition scores among male than female participants in each age group. This result is consistence with previous studies conducted by Al-Obaidi et al. (2011) and Yadav et al. (2011), who concluded that attrition was greater in males. Males have a stronger force for biting and larger muscle fibers. Also, males are liable to have more bad oral habits, which may be a constituent in the greater wear [12], [13]. Our findings, however, were in disagreement with other previous studies, which recorded that the greater attrition rates were among females and this inconsistency could be due to differences in the sample size, populations, or eating patterns [14].

5. Conclusion

The results of the study showed that tooth attrition was highly common among the population being considered, the attrition scores were higher among males than females and the attrition is significantly increased with age. To decrease the impact of tooth wear, our results highlight the importance of early diagnosis and preventive measures, particularly for middle-aged and older people. Further studies should take into account the predisposing factors of attrition, such as bad oral habits, eating patterns, and occlusal force in order to develop appropriate prevention and treatment plans.

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