FREQUENCY OF DENTAL ATTRITION AND COMMON ORO-DENTAL FACTORS

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Abstract

Objective: *The objective of this study was to find the frequency of dental attrition and common oro-dental factors leading to it. Study Design Descriptive (cross-sectional) Study. Setting: Oral medicine Prosthodontics Department, Peshawar dental college. Period: 10th December 2017 to 16th July 2019.*

Materials & Methods: *A total of 189 patients were included in the study. The male to female ratio was 0.95. The average age of the patients was 46.49 years ±6.93 (SD) with a range of 35-70 years. Dental attrition was seen in 66 (34.9%) patients.*

Results: *The most common cause was bruxism which was observed in 44 (23.3%) patients followed by Kennedy Class 1 partially dentate state in 36 (19.0%), clenching in 25 (13.2%) and unacceptable vertical overlap in 25 (13.2%) patients.*

Conclusion: *Irrespective of the extent dental attrition was a common finding in 35% patients. Bruxism is the most common cause of dental attrition, which is to be considered in management of such patients.*

Keywords: *Dental attrition, Unacceptable vertical overlap, Kennedy Class1, Bruxism, clenching*

INTRODUCTION

Tooth wear is non carious, irreversible loss of tooth structures and refers to attrition, abrasion, erosion and abfraction.[1] The condition is increasingly seen in patients reporting for restorative treatment and in fact, had been one of the reasons for the recognition of restorative dentistry as a clinical specialty in the U.K.[2] In different populations, irrespective of the extent of tooth wear, its prevalence is ranging between 3 and 17%.[3] It has also been shown in a sample population that 52% patients exhibited mild tooth wear.[4] Usually a patient reports to a dentist at a stage where tooth wear is of moderate or severe stage with signs of discoloration of teeth or dentine hypersensitivity.[5] This is a stage whereby treatment is considered not only costly but of a complex nature. Therefore, detecting it at an early stage is of paramount importance. Although the etiology of tooth wear is multifactorial, some 31-64% subjects exhibited pure tooth attrition1. Mild tooth wear has been referred to when teeth exhibit noticeable attrition with signs of flattening of normal planes of the surface contour.[6] Tooth attrition is a consequence of the factors leading to forceful motion, contacting surfaces of teeth. In a local population of young adults screened for presence of risk factors for temporomandibular disorders, irrespective of the severity of the level, some 9% of the patients exhibited 4 wear facets on occlusal surface of teeth indicating tooth attrition.[7] A study on the pattern of

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missing teeth in a population seeking prosthodontic consultations, 8% patients exhibited the partially dentate situation of Kennedy class 1.[8] In a U.S. based study, involving 1502 jaw cast of patients received at laboratory for removable partial denture making the proportion for Kennedy class 1 was relatively much higher with a figure of 38.4%.[9] It is to mention that in the unrestored Kennedy class 1, partially dentate situation leads to overloading of the remaining teeth with possible consequences of tooth wear. A local study of young adults showed that 14% subjects were having parafunctional habits of bruxing teeth while sleeping, 23% having the habit of clenching teeth while awake and 26% having anterior teeth with deep/vertical overlap. A more recent study involving local patients reporting for prosthodontic treatment, unacceptable vertical overlap of anterior teeth was seen in 12.3% patients.[2] Common sequels of missing teeth are aesthetic problems, masticatory inefficiency, speech problems, temporomandibular dysfunction syndrome, aged appearance and low self esteem.[10] Chewing insufficiency compels the patient to shift from well balanced to high carbohydrate diet this in turn results in increased dental disease (caries and periodontitis) and nutritional deficiencies.[11,5] Tooth wear is an accumulative life time process which is irreversible and multifactorial in nature. The clinical expression of dental wear largely depends on the strength, frequency, duration of exposure to abrasive and erosive challenges that can be modified to a certain extent by those biological factors, further investigations and continuous follow up of cases may allow the mapping of the relationship of biological factors with occurrence of tooth wear.[12] The current study is designed in order to determine the frequency of dental attrition and common oro-dental factors leading to it, among patients who presented with suspected clinical features. This study is the first of its kind in our local population and will thus help us to identify the magnitude of the problem locally and also the factors that led to the development of this condition. This study will be very useful in identifying the common factors which can lead to attrition and on the basis of results of this study we may be able to formulate certain recommendations not only in the early screening of dental attrition but also plan strategies for the control of common factors.

MATERIALS AND METHODS

Settings: Oral Medicine and Diagnosis, Prosthodontics Department Peshawar Dental College

Duration of study: 10th December 2017 to 16th July 2019

Sample Size: 189 using 23%2 proportion of clenching as a factor leading to dental attrition, 95% confidence interval and 6% margin of error under WHO sample size calculations.

Sample Technique: Consecutive (non-probability sampling).

Sample Selection Inclusion criteria:

- All patients presenting with highly suspected clinical features of dental attrition.
- Age groups 35-70 years
- Either gender

Exclusion Criteria:

Tooth wear cases predominantly due to erosion and abrasion. These included patients with:

- History of using an excessive amount of beverages and fruits.
- Those who are bulemic or suffering from acid regurgitation on history
- Those using tooth abrasive dentifrices and devices on history.
- Congenital condition like amelogensis imperfecta, dentinogenesis imperfecta and other congenital hypoplastic condition weakening tooth structure as diagnosed by clinical examination and medical records The above mentioned conditions act as confounders and if included, introduce bias in the study results.

Data Collection Procedure

The study was conducted after approval from REU of the RTMC College of physicians and surgeons committee. All patients meeting the inclusion criteria and presenting with highly suspected clinical features of dental attrition as per operational definitions were included in the study through OPD. The purpose and benefit of the study were explained to all patients and written informed consent was obtained. A detailed history and oro-dental examination were done for all patients to detect dental attrition. Among those patients in whom dental attrition was detected, they were further scrutinized for common oro-dental

factors leading to dental attrition i.e. unacceptable vertical overlap, Kennedy Class 1, bruxism and clenching of teeth. 58 The findings of the oro-dental examinations were obtained under the supervision of the consultant. All the above mentioned information including name, age, gender, and address were recorded in pre-designed proforma. Strict exclusion criteria were followed to control confounders and bias in the study results.

Data Analysis

All the data were analyzed by SPSS version 16; frequency and percentage were computed for categorical variables like gender, dental attrition and common oro-dental factors leading to dental attrition (unacceptable vertical overlap, Kennedy class 1, bruxism and clenching of teeth). Mean and standard deviations were calculated from numerical variables like age. The male to female ratio was calculated. Dental attrition and common oro-dental factors were stratified among age and gender. Results were presented in the forms of tables and graphs.

RESULTS

A total of 189 patients were included in the study. There were 92 (48.68%) males and 97(51.32%) females. The male to female ratio was 0.95 (Figure 10). The average age of the patients was 46.49 years ±6.93 SD ranging from 35 to 70 years. The patient's age was divided into four categories. In category one (35-45 years), these were 84(44.4%) patients and 55(29.1%) in 2nd category (46-50 years). In 3rd (51-55 years) and 4th (56-70 years) categories were 24(12.7%) and 26(13.8%) respectively. The data are given in Table 6. Dental Attrition was found in 66(34.9%) patients. The most common cause was Bruxism which was observed in 44(23.3%) patients followed by Kennedy Class 1 in 36(19.0%) patients. Clenching was in 25(13.2%) and unacceptable vertical overlap was noted in 25(13.2%) patients (shown in Table 7) Age wise distribution of dental attrition shows that dental attrition was observed in higher proportion as the age increases which is an indication that it is more common in older ages as compared to younger. The patients having age less than or equal to 46 years of age have 23.8% dental attrition, age group 46-50 years have 36.4% dental attrition, 51-55 years age groups have 50% dental attrition while more than 55 years of age have 53.8% dental attrition. This is shown in Table 8, and Figure 11. 60 Gender wise dental attrition and its common causes show that gender has also a minor role over of them. There were 18% dental attrition in males and 16.9% observed in female patients. Among the causes of dental attrition, Bruxism was 10.1% in male and 13.2% in female, Clenching was 9% in male and 4.2% in female, Kennedy Class 1 in male was 10.6% and 8.5% in female while Unacceptable vertical overlap was found 5.8% in male and 7.4% in female patients (shown in Table 9).

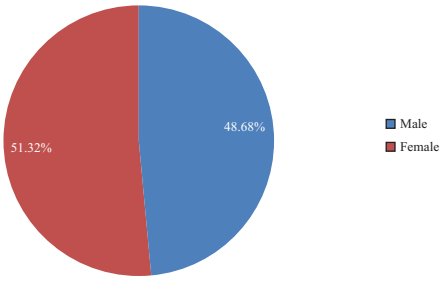

Fig 10: Gender wise distribution of patients

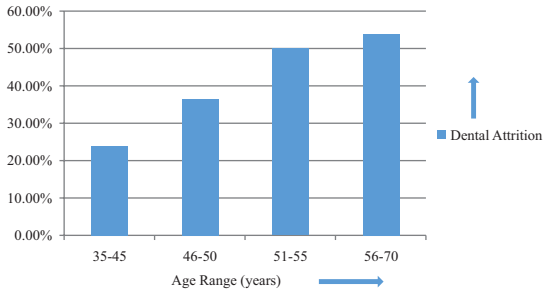

Fig 11: Age wise distribution of patients with dental attrition

Table 6: Frequency of patients with respect to age groups

Age Range	Frequency	Percent	Cumulative Percent
35-45	84	44.4	44.4
46-50	55	29.1	73.5
51-55	24	12.7	86.2
56-70	26	13.8	100.0
Total	189	100.0	

Table 7: Dental attrition and common causes

		Count	Percentage
Detnal Attrition	Yes	66	34.9%
	No	123	65.1%
Bruxism	Yes	44	23.3%
	No	145	76.7%
Clenching	Yes	25	13.2%
	No	164	86.8%
Kennedy Class 1	Yes	36	19.0%
	No	153	81.0%
Unacceptable vertical overlap	Yes	25	13.2%
	No	164	86.8%

Table 8: Age wise distribution of patients dental attrition

Age in years	Dental Attrition		Total	p-value
	Yes	No		
35-45	20 23.8%	64 76.2%	84 100%	0.011
46-50	20 36.4%	35 63.6%	55 100%	
51-55	12 50.0%	12 50.0%	24 100%	
56-70	14 53.8 %	12 46.2%	26 100%	
Total	66 34.9%	123 65.1%	189 100%	

Table 9: Gender wise distribution of patients with dental attrition and its common cause

		Gender				p-value
		Count	Table N %	Count	Table N %	
Dental Attrition	Yes	34	18.0%	32	16.9%	0.567
	No	58	30.7%	65	34.4%	
Bruxism	Yes	19	10.1%	25	13.2%	0.405
	No	73	38.6%	72	38.1%	
Clenching	Yes	17	9.0%	8	4.2%	0.038
	No	75	39.7%	89	47.1%	
Kennedy Class 1	Yes	20	10.6%	16	8.5%	0.359
	No	72	38.1%	81	42.9%	
Unacceptable vertical overlap	Yes	11	5.8%	14	7.4%	0.615
	No	81	42.9%	83	43.9%	

DISCUSSION

Tooth wear is an increasing dilemma and has been a problem to human since time immemorial.[13] As a successful approach in dental attrition management, it is highly crucial to identify the etiological factors. In many cases, the diagnosis might be complex due to multiple etiologic factors that may confuse the clinical appearance of dental attrition.[14] Early prediction of dental attrition can easily aid individuals who are at risk of developing dental attrition. The prevalence of dental attrition has been reported in several studies that have used many indexes for analysis.[15] In a study by Vant et al.[3] the prevalence of tooth wear ranging 3 and 17%. In such a study, besides using indices for examinations, different teeth and surfaces have been examined and surprisingly, results appeared in various ways, which as a result made it more complex to compare the results. It is highly important to recommend other working groups to conduct studies in order

to validate the diagnostic criteria and grading. In this study 189 patients were examined. The male to female ratio was insignificant and the was ratio was 0.95. In with accordance to study performed by Peres et al.[16] gender was not significantly correlated with dental attrition, this result came in sync with most studies assessing dental attrition in deciduous dentition which have not found any differences between different genders.[17] On the other hand, in U.K. a remarkable higher prevalence of exposed dentine was noted in boys than in girls and more boys had buccal/labial and lingual/palatal tooth surface erosion than girls.[18] Van Rijkom et al.[18] suggested that the one possible reason for the difference in prevalence of erosive tooth wear between boys and girls could be the difference of bite force and Pigno et al. found that males among children and adults had an increased prevalence of tooth wear, probably reflecting the higher bite force of males compared to females.[19] In our study dental attrition was found in 66(34.9%) patients. The most common cause was bruxism which was observed in 44(23.3%) patients followed by Kennedy Class 1 in 36(19.0%) patients. Clenching was in 25(13.2%) and unacceptable vertical overlap was noted in 25(13.2%) patients, In the study of 2,20 patients of Ghani et al. dental attrition was observed in young adults showed that 14% subjects were having parafunctional habit of bruxing teeth while sleeping, 23% have the habit of clenching teeth while awake and 26% having anterior teeth with deep/vertical overlap. Shah et al in a U.S9. based study, involving 1502 jaw cast of patients received at laboratory for removable partial denture making the proportion for Kennedy class 1 was relatively much higher with a figure of 38.4%.[9] It is to mention that in the restored Kennedy class 1, partially dentate situation leads to overloading of the remaining teeth with possible consequences of tooth wear Bruxism, which is a strong risk factor for dental attrition, failed to demonstrate a significant correlation as well. This result is less similar to those of previous studies.[21] Marbach[22] et al. found that only 34.4% of the patients with self reported bruxing in their study showed evidence of dental attrition; the authors noted that evidence of dental attrition does not necessarily indicate bruxing of the teeth. Detmar[23] et al. found no relationship between degree of tooth wear and the level of bruxism activity as measured by EMG. There was no association found between tooth wear and the socioeconomic status of children estimated by their parents' education and occupation. In previous studies, tooth wear in deciduous dentition has been uncertainly correlated with socioeconomic class. Harding[24] et al. and Kazoulis[25] et al. found higher tooth wear rates in families with low socioeconomic status, on the other hand, Luo[26] et al. and Mangueira[27] et al. found higher tooth wear rates in families with high educational level and in children who attended private schools. Several studies have been done in other parts of the world on dental attrition and wide age ranges of population examined.[28] In Iraq, although few studies have been carried out to investigate tooth attrition and mainly a study was carried out on 1500 Iraqi children of 5-14 years old to investigate bruxism and related factors.[29] Al-Obaidi and Rassim[29] investigated the prevalence of dental attrition in relation to temporomandibular joint problems among 166 Iraqi population aged 12-30 years, but there is still a lack of knowledge concerning the dental attrition in adult. In our study age wise distribution of dental attrition shows that dental attrition was observed in higher proportion as the age increases which is an indication that it is more common in older ages as compared to younger. The patients having age less than or equal to 46 years of age have 23.8% dental attrition, age group 46-50 years have 36.4% dental attrition, 51-55 years age groups have 50% dental attrition while more than 55 years of age have 53.8% dental attrition. In a recent study, the results of 186 prevalence studies of dental attrition by all causes, Van't Spijker3 et al. concluded that the percentage of adult patients presenting with severe dental attrition increased from 3% at the age of 20 years to 17% at the age of 70 years, with a tendency to develop more attrition with age. Likewise, the results of a large epidemiological study amongst German dental patients reported similar results, where the extent of tooth wear was scored on a scale from 0 to 3 (with higher scores indicating more severe levels of tooth wear), with mean wear scores increasing from 0.6 amongst 20- 29-year-olds to 1.4 in 70-79 year olds.[30]

CONCLUSION

The present study shows that bruxism is the most common cause of dental attrition followed by Kennedy class 1. Other factors such as clenching and unacceptable vertical overlap also contribute to the cause of dental attrition. In our study gender was not significantly correlated with dental attrition.

The age wise distribution of dental attrition shows that it is more common in older ages as compared to younger. Recommendations Identification of risk factors such as unacceptable vertical overlap, Kennedy class 1, bruxism, clenching may alert subjects at risk of developing dental attrition to appropriately modify their lifestyles or seek treatment to prevent dental attrition. Our study suggested that all these factors might be related to a reduced risk of dental attrition. It is also highly important to recommend other working groups to conduct studies in order to validate the diagnostic criteria and grading.

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