



PREVALENCE AND GENDER BASED ANALYSIS OF DENTAL ATTRITION IN ANTERIOR AND POSTERIOR TEETH: A CROSS-SECTIONAL STUDY IN THE POPULATION OF HYDERABAD

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ABSTRACT

Background: Dental attrition is the gradual wearing of tooth surfaces due to friction or grinding. It is one of the most neglected dental issues. **Aim:** The aim of this study is to find the prevalence of dental attrition in anterior and posterior teeth while exploring potential gender disparities in the population of Hyderabad. **Materials and Methods:** This study was conducted by OroGlee Solutions Private Limited in Hyderabad. A total of 2,553 subjects aged between 18 to 60 years were examined. Oral examination was done using an intraoral camera. **Results:** The prevalence of attrition is more in anterior teeth (22.56%) than posterior teeth (8.89%). Also, the prevalence of attrition is more in males (34.25%) when compared to females (24.56%) in the population of Hyderabad. **Conclusion:** By recognizing the differences in attrition patterns in anterior and posterior teeth in males and females, dental professionals can tailor appropriate preventive strategies and treatment approaches. Raising awareness about the prevalence of attrition and its potential implications is essential for empowering individuals to take proactive steps in preserving their dental health.

KEYWORDS : Dental attrition, Tooth wear, Bruxism, Intra oral camera, Hyderabad

INTRODUCTION

Tooth wear is an inherent aging process and occurs slowly but continuously throughout life. As tooth wear progresses, it alters the appearance of the teeth and the smile. The most common type of tooth wear pattern is dental attrition. Attrition is the loss of tooth material that results from mechanical wear between opposing teeth surfaces during masticatory and parafunctional movements.⁽¹⁾ Attrition is derived from the Latin word attritum, which means to rub against something.⁽²⁾ It is a physiologic process. While a certain degree of tooth wear is considered normal, a severely damaged dentition may increase the risk of developing functional issues. Attrition is seen to be increasing in the young adults, especially adolescents.⁽³⁾ Potential causes of attrition include bruxism, certain oral hygiene products (toothpastes with abrasive agents and local chewing sticks) and dietary habits like chewing hard foods.⁽⁴⁾

Dental attrition can expose the underlying dentin, which can lead to dentinal hypersensitivity and reduced chewing ability. Severe attrition causes pulpal pathology, occlusal disharmony, decreased function, and cosmetic deformity. To cure severe attrition, complex full-mouth dental rehabilitations may be required.⁽¹⁾ This study aims to determine and compare the prevalence of dental attrition in both anterior and posterior teeth, with a specific focus on comparing prevalence between males and females. It will also offer insights that can provide customized preventive and treatment strategies for populations at risk of dental attrition.

MATERIALS AND METHODS

A cross-sectional survey was conducted by OroGlee Solutions Private Limited among the employees of corporate offices in the city of Hyderabad. A total of 2,553 individuals were examined.

A survey questionnaire was prepared to acquire personal details such as age, gender, relevant dental and medical history and habits. Oral examination was done using an intraoral camera connected to a laptop to record videos of all aspects of teeth. Informed oral consent of the participants was obtained before examination.

Some studies on attrition have only considered the moderate and severe stages of dental attrition i.e., score ≥ 3 of Smith and Knight tooth wear index, 1984 since they are clinically more significant. In this study, attrition is considered when the score is ≥ 2 as there is a higher chance of progression from a

score of 2, to the more severe forms.

Inclusion Criteria:

1. Participants in the age group of 18 to 60 years were included in this study.
2. Only permanent teeth were included in the study.

Exclusion Criteria:

1. Participants below the age group of 18 years and above the age group of 60 years were excluded from this study.
2. Third molars were excluded.
3. Retained deciduous teeth and supernumerary teeth were excluded.

RESULTS

A total of 2,553 participants in the age group of 18 to 60 years were screened. Out of these, 803 participants had attrition with a score ≥ 2 according to Smith and Knight tooth wear index. This accounts for prevalence of attrition of 31.45%. Among these 2,553 participants, 1,816 were males and 737 were females. Out of these, 622 (34.25%) males were found to have attrition and 181 (24.56%) females had attrition (Table 1).

Table 1: Prevalence Of Attrition In Males And Females

Gender	Total Participants	Participants with attrition (n)	participants with attrition (%)
Males	1,816	622	34.25%
Females	737	181	24.56%

Out of 2,553 participants, 576 have attrited anterior teeth (22.56%) and 227 have attrited posterior teeth (8.89%). Among 1,816 males, 447 (24.61%) have anterior teeth attrition and 175 (9.64%) have posterior teeth attrition. Among 737 females, 129 (17.50%) have anterior teeth attrition and 52 (7.06%) have posterior teeth attrition. This signifies that anterior teeth have more attrition than posterior teeth in males as well as females (Table 2).

Table 2: Prevalence Of Attrition In Anterior And Posterior Teeth In Males And Females

Category	No. of participants	Attrited anterior teeth	Attrited posterior teeth
Males	1816	447 24.61%	175 9.64%
Females	737	129 17.50%	52 7.06%
Total	2553	576 22.56%	227 8.89%

The above data signifies that, prevalence of attrition is more in anterior teeth than posterior teeth and is more in males when compared to females.

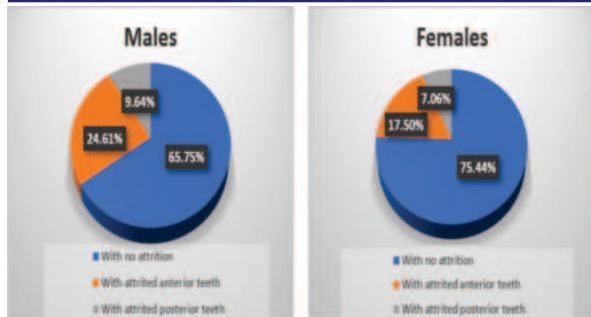


Fig.1: Pie Chart Showing Prevalence Of Attrition In Males And Females In The Population Of Hyderabad

DISCUSSION

Attrition is the loss of hard tissue caused by frictional forces between opposing teeth or between the tooth's occlusal surface and food during masticatory and non-masticatory movements, without the occurrence of dental caries or trauma.⁽⁵⁾ Occlusal wear facets (worn off areas on the tooth due to attrition) are polished, smooth, sharp-edged and well-delineated surfaces of the occlusal surface, due to tooth-to-tooth contact during masticatory or para-functional movements.^(11,16) They are typically observed on the incisal edges of anterior teeth and the occlusal surfaces of posterior teeth.⁽¹¹⁾ The most obvious indication of functional wear is the dental attrition.⁽⁷⁾

Etiology of Attrition

Dental attrition is a physiological phenomenon. However, there are several factors which can contribute to pathological or severe occlusal wear. The common etiological factors include:

1. Age: Ageing is the most common etiological factor.⁽⁸⁾
2. Congenital malformations: Teeth are more susceptible to rapid wear due to developmental anomalies, specifically amelogenesis imperfecta (thin enamel) and dentinogenesis imperfecta (defective dentin).⁽³⁾
3. Bruxism: Bruxism, characterised by grinding and/or clenching of teeth due to abnormal movements of the mandible, can also lead to attrition.⁽⁸⁾
4. Other parafunctional habits: In addition to bruxism, habits such as holding objects like pens, pencils, or a smoking pipe between the teeth can also accelerate tooth wear.⁽³⁾
5. Gender: Males are more frequently affected by dental attrition than females. This is attributed to their stronger ligaments and greater muscle mass, which result in increased force during mastication. Additionally, the higher prevalence of tobacco chewing among males further contributes to this disparity.^(11,18)

Scoring of Dental Attrition

Smith and Knight tooth wear index 1984 is the index to score the severity of attrition. There are five levels in the Smith and Knight index, ranging from 0 to 4. Level 0 represents no attrition. Level 1 represents deterioration of enamel, while level 2 indicates early dentine exposure. Level 3 indicates advanced dentine exposure and level 4 indicates pulp exposure.⁽¹⁰⁾

Management of Dental Attrition

Diagnosis

Attrition can be diagnosed by visual inspection and radiographs. There are simple scales to know the severity like the Smith and Knight Tooth Wear Index, 1984. An accurate diagnosis requires a systematic history-taking process combined with a detailed clinical examination. While multiple factors are often involved, it is generally possible to determine the primary cause.⁽¹¹⁾

Prevention

Due to its growing prevalence, tooth wear should be treated as a community-wide concern. The effectiveness of prophylaxis is limited by the multifactorial nature of attrition. Therefore, adopting lifestyle changes offers a more practical and efficient approach to preventing attrition. These changes include dietary modifications, avoiding hard foods, and using non-abrasive toothpaste. Preventive regimens also include psychological encouragement for lifestyle modifications.⁽¹¹⁾

Treatment Strategies

For patients with physiological wear who have no functional or aesthetic concerns and no associated symptoms, therapy should primarily focus on preventive measures and regular monitoring.⁽¹¹⁾

The treatment strategies include various methods to treat the etiological factors of attrition. Correcting occlusal prematurity is necessary.⁽³⁾ If only the anterior segments are affected a temporary crown or an anterior cobalt-chromium detachable splint can be used.⁽¹¹⁾ Professional counselling, behavioural therapy techniques like habit reversal training, and dental devices such as mouthguards or bite splints can be helpful for people with bruxism and other parafunctional habits.⁽¹²⁾ Alternative restorative procedures like composite restoration and metal crowns in case of heavy bruxers can be used. Because long-term outcomes are unknown, treated cases need to be routinely followed up by examining clinically and radiographically.⁽³⁾

In our study, a total of 2,553 participants between 18 to 60 years, in the city of Hyderabad were screened. Out of these, 803 participants were found to have attrition (31.45%). Out of the 2,553 participants, 1,816 were males and 737 were females. Among them, 622 males (34.25%) and 181 females (24.56%) have attrition. In the total study population, 576 have attrited anterior teeth (22.56%) and 227 have attrited posterior teeth (8.89%). Out of 1,816 males, 447 (24.61%) have attrited anterior teeth and 175 (9.64%) have attrition of posterior teeth. Among 737 females, 129 (17.50%) have attrition of anterior teeth and 52 (7.06%) have attrited posterior teeth. This signifies that the prevalence of attrition is more in anterior teeth than posterior teeth and is more in males than in females.

A cross-sectional study was conducted by Roopa K Thippanna and Vijayalakshmi C Ramu in the College of Dental Sciences, Davangere, Karnataka, among the dentulous and partially edentulous individuals seeking dental treatment. A total of 570 people were examined, among which 267 were males and 303 were females. Mean attrition scores of males and females was 0.99 and 0.67 respectively. Statistically significant mean attrition scores ($p < 0.05$) were recorded, with males exhibiting more attrition than females.⁽¹¹⁾

In the study conducted by Karthik EVG, Manish Ranjan and Uma Maheshwari at Saveetha Dental College, Chennai, a total of 919 participants with attrition in lower molars were included. It was observed that the frequency of attrition was higher in males (62%) compared to females (38%).⁽⁵⁾

A study was conducted by F. Khan et al., in Tooth Wear Clinic at The University of Queensland, School of Dentistry, Australia. A total of 122 participants were selected among whom 81 were males (66.4%) and 41 were females (33.6%). Impression was taken from each patient and models were poured and examined for attrition and scored using scanning electronic microscope (SEM). Attrition was noted more in the anterior teeth than in the posterior teeth.⁽¹³⁾

A cross-sectional study was conducted by Kiran Fatima et al., in Oral Medicine and Diagnosis, OPD of Bahria University of Medical and Dental College from January 2017 to June 2017. A total of 526 participants with tooth wear were included, among

whom 363 (69%) were males and 163 (31%) were females. The study showed that attrition was more prevalent in males than in females. Contradictory to our study, this study showed a greater prevalence of attrition in posterior teeth than in anterior teeth. This might be due to harder and stronger biting forces in the study population.^[14]

CONCLUSION

Our study highlights that dental attrition is more common in anterior teeth than in posterior teeth, likely due to their position and functional role in parafunctional habits such as bruxism. Furthermore, a higher incidence of attrition was observed among males, likely due to stronger ligaments, greater muscle fibre mass, and the higher prevalence of tobacco chewing habits. These findings underscore the importance of raising patient awareness regarding the prevalence of attrition in anterior and posterior teeth across genders. Public education on preventive measures can significantly reduce the incidence of attrition and prevent its progression. Early intervention, coupled with post-treatment maintenance, can help mitigate complications such as sensitivity, treatment failure, and relapse. By emphasizing on prevention and timely care, this study contributes to the broader effort of promoting oral health and improving patient outcomes.

Conflict Of Interest: There is no conflict of interest.

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