

Prevalence of dental wear and association with age and presence of systemic diseases

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Abstract

Aim: To determine the prevalence of Dental wear among the patients who reported to Saveetha Dental College and to correlate the association with age of the patients and presence of any underlying systemic disease.

Materials and Methods: The current study was done for 150 patients that walked into Saveetha Dental College between a time span of a year, with a complaint of tooth wear. Data was collected from Dental Information Archiving Software (DIAS), the record maintenance system of the college. Data was tabulated in an Excel sheet and the results and statistics were obtained using the SPSS software. Descriptive statistics was used to describe the frequency of the distribution and Correlation analysis was performed to derive a relation between dental attrition, age, and presence of systemic disease.

Results: Descriptive statistics and Correlation analysis was performed at 5% level of significance. Erosion was the most commonly found type of dental wear

predominantly in the age group of 51-60 years, followed by 41-50. 20% of cases with dental wear belonged to the age group of less than 40 years . 30.6% of totally examined patients with dental wear presented with a systemic disease. Statistical analysis did not reveal any significant correlation.

Conclusion: The study shows a shifting trend showing patients under the age group of 40 years presenting with dental wear. The presence of dental wear in association with underlying systemic diseases was also dwelled upon. Studies with larger sample sizes need to be done to establish an accurate relation between these factors as they could play a major role in understanding the multifactorial etiology of this phenomenon thereby enhancing the process of diagnosis and treatment planning.

Keywords: Dental Wear, Attrition, Tooth wear, Dental Erosion, Age, Systemic Diseases

Introduction

Maintenance of the health and structure of dental tissues plays an important role in maintaining the balance of

stomatognathic system (Subasree, Murthykumar and Dhanraj, 2016), (Ajay et al., 2017; Basha, Ganapathy and Venugopalan, 2018). Dental Wear is an umbrella term which encompasses tooth wear occurring due to a multitude of etiologies and includes: Attrition; Abrasion; Erosion; (Srisilapanan, Jindarat and Roseman, 2018). While Attrition represents the loss of tooth structure due to forces of opposing teeth, abrasion represents the tooth wear due to a mechanical agent such as aggressive use of toothbrush (Holbrook et al., 2009). Erosion comprises dental wear occurring as a result of a combination of mechanical and chemical factors related to the acid from the diet (Bartlett et al., 2011). Dental wear being a progressive disorder affects both function and esthetics (Omar et al., 2012). Tooth wear on a generalised scale can lead to loss of vertical dimension, subsequently leading to poor masticatory efficiency, phonetics and esthetics (Turner and Missirlian, 1984; Ashok et al., 2014; Venugopalan et al., 2014). It could lead to an array of periodontal complications (Jyothi et al., 2017), and affect the harmony of the stomatognathic system (Ganapathy, Kannan and Venugopalan, 2017; Duraisamy et al., 2019). Rehabilitation of wear at a greater scale can also prove to be complicated, interdisciplinary and expensive for the patient (O'Toole et al., 2018). There is limited research related to dental wear as its etiology is multifactorial and no single index has been universally accepted for its quantification (Janson et al., 2010). Moreover most of the research discusses dental wear as a condition associated with the elderly. Dental wear specifically erosion has been spotted commonly among the younger population. This change of trend could be associated with the change in contemporary lifestyle, dietary and hygiene related habits (Aguiar et al., 2014) (Ganapathy et al., 2016).

Studies done by Bo Liu et al (Liu et al., 2014) and Sayed ME et al (Sayed et al., 2017)

describe dental wear and its type typical association in the older age group. Studies typically related to dental erosion were done by Luciano L et al (Luciano, Ferreira and Paschoal, 2017) and Skalsky et al (Skalsky Jarkander, Grindafjord and Carlstedt, 2018) discussing the possible etiological factors.

The underlying systemic condition (Selvan and Ganapathy, 2016; Vijayalakshmi and Ganapathy, 2016) of the patient could also be an associating or aggravating factor in patients with dental wear. There is limited literature on the prevalence of dental wear especially attrition and abrasion in relation to presence of systemic diseases in patients. Hence this study aims to assess the prevalence of dental wear among the patients and to derive an association with age and presence of any underlying systemic conditions.

Material and Methods

The current study was done in a university hospital setting of Saveetha Dental College, Chennai. The study was approved by the Institutional Review Board.

150 patients whose chief complaint was related to wear of teeth and associate complication were selected for this study. The study was designed to be retrospective, and reviewed the case sheets obtained from the Dental Information Archiving Software (DIAS) that maintains all the general information, treatments provided and photographs of the patients. Case sheets of all these 100 patients were reviewed to assess the type of dental wear they complained of, their age group and presence of any underlying systemic condition, and if present the kind of systemic disease they presented with.

All the information was cross verified and tabulated in Excel Sheet. Confidential details of the patients were masked. Statistical analysis was done using SPSS

software Version 24. Descriptive statistics was used to describe the frequency and percentages of association. Correlation analysis was performed to analyse the relation between the type of dental wear, age group and presence of underlying systemic disease.

Results

The data obtained from the case sheets were tabulated using Excel sheets and statistical analysis was performed using SPSS software.

Table1: depicts the frequency distribution of the type of dental wear among age and systemic disease.

		Dental Wear	
		Attrition	Erosion
Sex	Male	51%	48.5%
	Female	35%	64%
Age	20-40 years	24%	16%
	41-50 years	24%	23%
	51-60 years	34%	35%
	61-70 years	11%	16%
	71-80 years	5%	8%
Presence of Systemic Disease	Yes	27%	33%
	No	73%	75%
Type of systemic Disease	Hypertension	12%	10%
	Hypertension + Diabetes	7%	7%
	Diabetes	5%	13%
	Gastric Diseases	0%	7.5%
	Renal Dysfunction	1%	2.5%

Of the total population presenting with dental wear, 70% were males of which 51% presented with attrition and 48.5% presented with erosion and 30% were females of which 35% presented with attrition and 64% presented with erosion (Table 1).

Dental wear in general which was reported belonged majorly to the age group of 51-60 years followed by 41-50 years. It was also interesting to note how prevalent the findings were in the age group of 20-40 considering the fact that dental wear was always considered a condition associated with the elderly. Out of the 150 patients 30% patients reported either one or more of systemic diseases. Hypertension was the most reported systemic condition associated with attrition (12%), whereas diabetes was most reported in association with erosion (13%).

Statistical analysis done to derive an association between age group, and presence of an underlying systemic disease did not show a statistical significance.

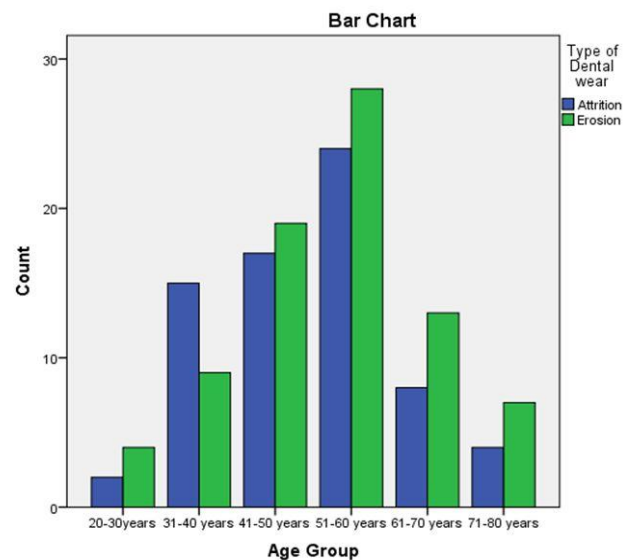


Fig 1: Shows the prevalence of Dental wear among different age groups

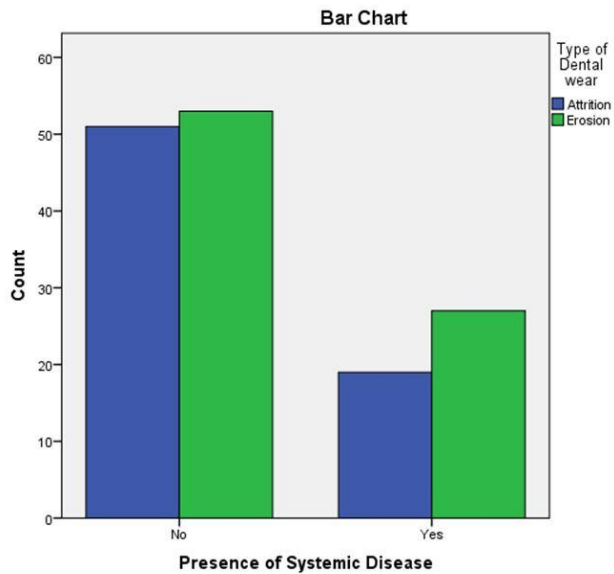


Fig 2: Depicts presence of systemic diseases in patients with dental wear.

Discussion

Dental Wear is an irreversible process that accumulates with time and the etiology of which is believed to be multifactorial (Ariga et al., 2018). Since quantifiability of wear is questionable due to the lack of standardised indices, measuring and associating the kind of tooth wear has always been a grey zone in research (Eccles, 1979). In terms of etiology of tooth wear were authors such as Bryant et al (Website, no date) and Carlsson et al ('Predictors of bruxism, other oral parafunctions, and tooth wear over a 20-year follow-up period', 2003) believed the masticatory forces of teeth to be the primary cause of wear, Pullinger et al (Pullinger and Seligman, 1991) and Seligman et al (Seligman, Pullinger and Solberg, 1988) believed the etiology to be more complex and derived associations with dental malocclusion (Jain, Ranganathan and Ganapathy, 2017), opposing restorations (Ashok and Suvitha, 2016), gender and also took into consideration other elements of the stomatognathic system. The extent of dental erosion may be associated with the time and type of contact with

erosive agents, the extent of mineralisation of teeth and the composition of saliva (Mulic et al., 2012). Where most studies done on attrition attributed it be found in the elderly, erosion showed prevalence among the youth and especially children. The global prevalence of erosion in children shows variation ranging from 7.2% (Vargas-Ferreira, Praetzel and Ardenghi, 2011) to 95% (Al-Majed, Maguire and Murray, 2002).

The current study showed the prevalence of erosion in the age group of 51-60 years similar to the rates of attrition and showed that 13% of the people presenting with erosion presented with associated diabetes. There is precedent nature to correlate

A study done by Srisilapanan et al evaluated the prevalence of dental wear seen in diabetic patients in Thailand and found statistically significant correlation (Srisilapanan, Jindarat and Roseman, 2018). The study though did not differentiate the type of wear seen. Similar studies were done in China by Liu B et al (Liu et al., 2014) and even inferred that the wear reported by him in China were less than the wear rates in India.

In the current study age group showing dental wear was studied, and it agrees with the above studies in the fact that the patients belonging to the age group of 51-60 years presented with maximum cases of wear. This could be attributed to the aspect of physiologic wear of teeth. An in vitro study by Lambrechts et al (Lambrechts et al., 1989) quantified the wear to be 20-38 micro meter per annum. This study also reported about 24% of the population assessed with dental wear to be between the age group of 20-40 years. The psychological stress attributed to hectic work lives in the younger population could be a propagating factor to the observed result (Tsai et al., 2002). This also depicts the changing trends in dental wear with respect to the association with age group.

Conclusion

Dental wear is an irreversible wear of tooth structure and should be considered seriously. With shifting trends, the increasing prevalence of attrition among the young adult population is a major concern as the restoration of such defects is complicated and comes at a great cost to the patient. Since the etiology of wear is multifactorial, it is essential to analyse all possible parameters which could be responsible. Studies done on the correlation between the presence of dental wear and presence of an underlying systemic disease is limited. Further research on the different factors believed to be involved in the etiology of dental wear has the potential to change the way we diagnose and plan dental wear and could help us better understand the multifactorial etiology.

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