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PREVALENCE OF DENTAL WEAR AND ASSOCIATION WITH AGE AND PRESENCE OF SYSTEMIC DISEASES

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ABSTRACT

Aim was 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. 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 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. 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% 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. 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 were 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: Age; Attrition; Dental Erosion; Dental Wear; Tooth wear; Systemic Diseases

INTRODUCTION

Maintenance of the health and structure of dental tissues plays an important role in maintaining the balance of stomatognathic system [1-3]. Dental Wear is an umbrella term which encompasses tooth wear occurring due to a multitude of etiologies and includes: Attrition; Abrasion; Erosion; [4]. 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 [5]. Erosion comprises dental wear occurring as a result of a combination of mechanical and chemical factors related to the acid from the diet [6]. Dental wear being a progressive disorder affects both function and esthetics [7]. Tooth wear on a generalised scale can lead to loss of vertical dimension, subsequently leading to poor masticatory efficiency, phonetics and esthetics [8-10]. It could lead to an array of periodontal complications [11], and affect the harmony of the stomatognathic system [12, 13]. Rehabilitation of wear at a greater scale can also prove to be complicated, interdisciplinary and expensive for the patient [14].

There is limited research related to dental wear as its etiology is multifactorial and no single index has been universally accepted for its quantification [15]. Moreover most of the research discusses dental wear as a condition associated with the elderly [16]. 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 [17, 18].

Studies done by Bo Liu *et al* [19] and Sayed ME *et al* [20] 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* [21] and Skalsky *et al* [22] discussing the possible etiological factors. Previously our team has a rich experience in working on various research projects across multiple disciplines [23-37].

The underlying systemic condition [38, 39] 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 institution's record maintenance system that meticulously 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 AND DISCUSSION

The data obtained from the case sheets were tabulated using Excel sheets and statistical analysis was performed using SPSS software. 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. There was a statistically significant correlation between age and the type of dental wear seen (0.169). 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%).

Correlation analysis (Spearman) showed that there was a statistically significant correlation between age group and dental

wear seen among the patients (0.169). There was a positive correlation seen with type of systemic disease and gender and a weak positive correlation between the presence of systemic disease in patients with dental wear.

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

		Dental Wear		Correlation Coefficient
		Attrition	Erosion	
Gender	Male	51%	48.5%	0.145
	Female	35%	64%	
Age Group	20-40 years	24%	16%	0.169
	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%	0.063
	No	73%	75%	
Type Of Systemic Disease present	Hypertension	12%	10%	0.184
	Hypertension & Diabetes	7%	7%	
	Diabetes	5%	13%	
	Gastric Dysfunction	0%	7.5%	
	Renal Dysfunction	1%	2.5%	

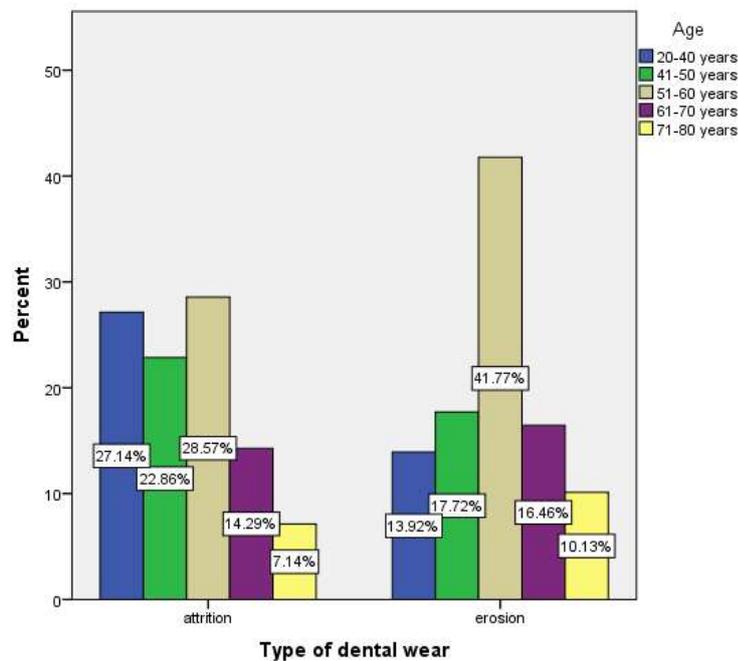


Fig 1: Bar graph depicting the relation of dental wear (X-axis) with respect to the frequency distribution of age group in percentage (Y-axis). Blue represents the age group of 20-40 years, green represents the age group of 41-50 years, beige represents 51-60 years, and 61-70 years depicted by purple and 71-80 years depicted by yellow. The graph shows that both attrition and erosion was most commonly seen in the age group of 51-60 years. The relation showed a statistically significant correlation, 0.165 (spearman correlation)

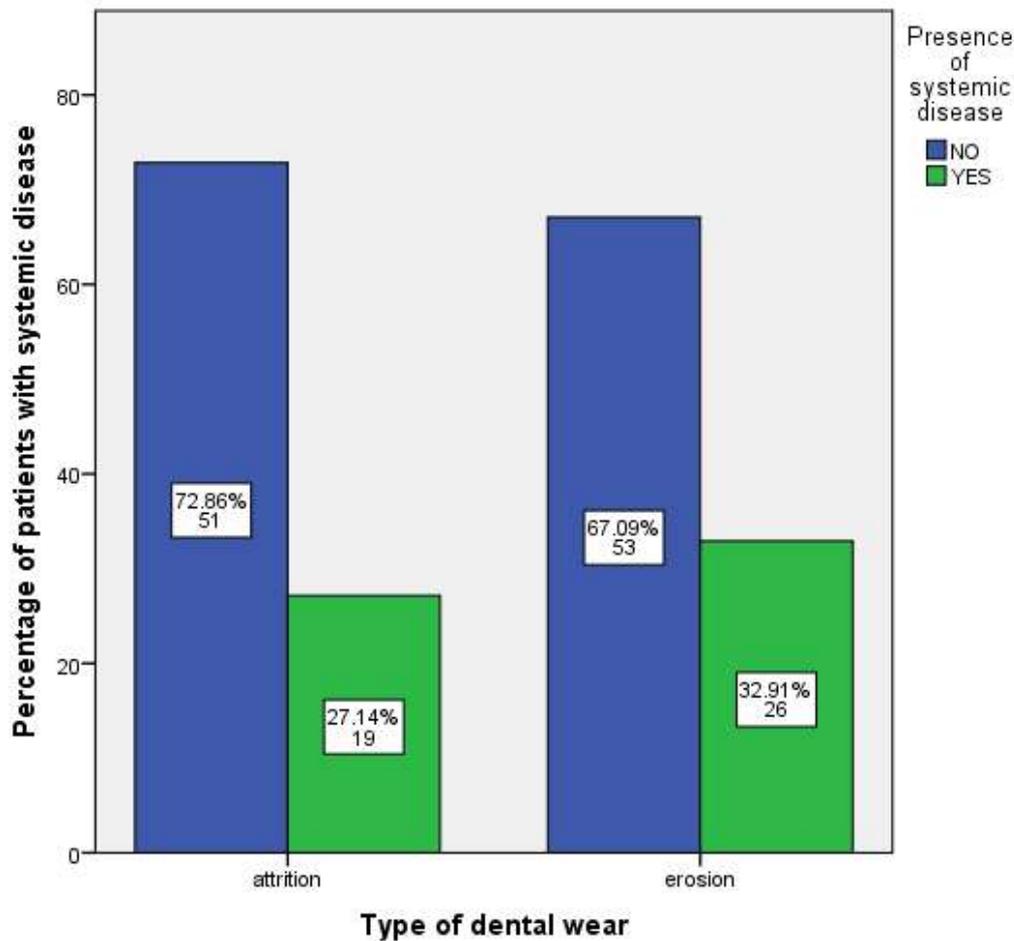


Fig 2: Bar graph representing relation between type of dental wear (X-axis) and percentage of patients with systemic diseases(Y-axis). On the graph blue represents 'No' and green represents 'Yes'. The graph shows that 27.14% patients with attrition and 32.19% patients with erosion, had underlying systemic diseases. This relation showed a weak positive correlation 0.063. (Spearman correlation)

Dental Wear is an irreversible process that accumulates with time and the etiology of which is believed to be multifactorial [40]. 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 [41]. In terms of etiology of tooth wear were authors such as Bryant *et al* [42] and Carlsson *et al* [43] believed the masticatory

forces of teeth to be the primary cause of wear, Pullinger *et al* [44] and Seligman *et al* [45] believed the etiology to be more complex and derived associations with dental malocclusion [46], opposing restorations [47], 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 [48]. 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% [49] to 95% [50]. 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 contrary to the precedent nature to correlate dental erosion with gastric disorders. A study done by Srisilapanan *et al* evaluated the prevalence of dental wear seen in diabetic patients in Thailand and found statistically significant correlation [4]. The study though did not differentiate the type of wear seen. Similar studies were done in China by Liu B *et al* [19] and even inferred that the wear reported by him in China were less than the wear rates in India. Our institution is passionate about high quality evidence based research and has excelled in various fields [51–57]. We hope this study adds to this rich legacy.

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* [58] quantified the wear to be 20-38 micrometers 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 [59]. 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 multifactorial etiology.

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