

PREVALENCE OF TOOTH WEAR AMONG OUT PATIENTS ACCORDING TO TURNER AND MISSIRLIAN CLASSIFICATION - A RETROSPECTIVE STUDY

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ABSTRACT

Tooth wear is a multifactorial condition which can lead to the loss of dental hard tissue which is enamel and dentin. Attrition is mechanical wear of tooth as a result of function or parafunctional habit caused due to tooth to tooth contact. Attrition on the occlusal surfaces of teeth is happening throughout life which results in esthetic disfigurement, occlusal disharmony, pulpal trauma and impaired function. Premarily diagnosis, treatment and preventive measures of tooth wear is necessity and an important part of day today practice. Hence, the aim of this study is to determine prevalence of tooth wear based on age and gender. A cross-sectional study was conducted among patients with age groups of 27-73 years and reviewing the 86,000 patient records between June 2019 to November 2019. A total of 58 patients were evaluated for category, age and gender of tooth wear. The Collected data were recorded by evaluating the clinical photographs and examination. Data were collected and tabulated in the excel sheets which were Imported to the SPSS version 20 for statistical analysis. Out of 58 patients 53.4% were males and 46.6% were females. The prevalence of tooth wear is more among 61-70 years of age with male predilection. The most prevalent type is category 2 followed by category 1 and category 3.

Key Words: Age; Attrition; Gender; Tooth wear

INTRODUCTION

Tooth wear is a multifactorial condition. It can lead to loss of dental hard tissue which is enamel and dentin (Shellis, Peter Shellis and Addy, 2014). It is divided into mechanical wear (attrition and abrasion) and chemical wear (erosion). Attrition is a mechanical wear which is caused due to functional, parafunctional habit or due to tooth to tooth contact (Wetselaar *et al.*, 2016). Abrasion is mechanical wear which results in oral hygiene procedures and habits such as nail-biting or pen-biting and erosion is chemical wear due to extrinsic or intrinsic acids (Ganss and Lussi, 2014); (Kitasako *et al.*, 2015). These exhibit well defined progressions and unique clinical characteristics (Rashid, Hanif and Nasim, 2015).

The wear and tear on the occlusal surfaces of teeth which results in display of dentin causing dentinal hypersensitivity and subsequently reduced chewing function (Al-Omiri, Lamey and Clifford, 2006; Hegde and Nireeksha, 2015). Excessive tooth wear can lead to major outcomes such as esthetic disfigurement, pulpal pathology, occlusal disharmony, impaired function (Pigno *et al.*, 2001). Tooth wear is observed as a natural physiological process during aging (Pillai, Sivasankara Pillai and Bhaskar, 1974; Smith, Bartlett and Robb, 1997; Brkic, Milicevic and Petroveck, 2006; Kreulen *et al.*, 2010; d’Incau, Couture and Maureille, 2012; Grimoud *et al.*, 2012). In addition, to that other factors such as parafunctional habits, tooth loss, change of mandibular movements, bite forces, geographic and environmental conditions

which influences the tooth wear process (Donachie and Walls, 1995; O. Bernhardt *et al.*, 2004). Excessive wearing of teeth can cause alteration of the vertical dimension of occlusion (Prasad, Kuracina and Monaco, 2008). Physiological tooth wear causing vertical loss of enamel in a normal individual is approximately 0.02–0.04 mm a year (Kaidonis *et al.*, 1998). Classify severely worn dentition based on Turner and Missirlian classification. It is categorized into three, Category-1: Excessive wear with loss of VDO. Category-2: Excessive wear without loss of VDO but with space available. Category-3: Excessive wear without loss of VDO but with limited space (Turner and Missirlian, 1984; Krishna, Rao and Goyal, 2005).

Tooth eruption and alveolar bone growth maintains vertical dimension of occlusion. The alveolar bone tends to undergo an adaptive process and it compensates for the loss of tooth structure to maintain the VDO (Jahangiri and Jang, 2002; Dawson, 2007). The incidence of tooth wear varies with different countries based on the eating habits (Kullman, 1995; Yun *et al.*, 2007; Bartlett *et al.*, 2011; Basset, 2012). Several studies agreed that degenerative diseases of teeth vary amongst different ethnic groups (Yun *et al.*, 2007; d’Incau, Couture and Maureille, 2012; Grimoud *et al.*, 2012; Vieira *et al.*, 2015). For this cause, it is cardinal to accomplish investigations with different populations. Primarily diagnosis, treatment and preventive measures of tooth wear is necessity and an important part of day today practice. Hence, the aim of this study is to determine prevalence of tooth wear among patients according to turner and missirlian classification.

MATERIALS AND METHODS

A cross-sectional study was conducted among patients with tooth wear visiting private Dental Hospital, Chennai. Ethical approval for the study was obtained by the Institutional Review Board (IRB Approval No: SIHEC/2020/DIASDATA/0619-0320). The collected data were reviewed of 86,000 patient records between 1st June 2019 to 31st March 2020 based on data availability from Dental Information Archiving Software (DIAS). A total of 58 patients (31 males and 27 females) aged between 20 to 70 years old were assessed for tooth wear, age, and gender. The patients were randomly divided into five age groups, Group 1- 20 to 30 years; Group 2- 31 to 40 years; Group 3- 41 to 50 years; Group 4- 51 to 60 years; Group 5- 61-70 years. Presence of complete permanent dentition with two or more missing teeth in the anterior and/or posterior region of the dental arch were included in this study. Complete edentulism and incomplete data were excluded from the study. Informed consent was obtained from patients. Clinical oral examinations were analyzed according to turner and missirlian classification. Intraoral photographs of all patients were cross verified by a single operator. The data were recorded and tabulated in excel sheets which were imported to SPSS version 20 (IBM corporation). Descriptive statistics and Chi square test was used to determine the association between the variables where P value < 0.05 is considered statistically significant with a confidence interval of 95%.

RESULTS & DISCUSSION

Previously our team has conducted numerous original studies (Shree, Kumar and Ganapathy, no date; Ashok *et al.*, 2014; Venugopalan *et al.*, 2014; Ganapathy, 2016; Selvan and Ganapathy, 2016; Subasree, Murthykumar and Dhanraj, 2016; Vijayalakshmi and Ganapathy, 2016; Jyothi *et al.*, 2017; Ariga *et al.*, 2018; Basha, Ganapathy and Venugopalan, 2018; Anjum, Ganapathy and Kumar, 2019; Inchara, Ganapathy and Kumar, 2019; Ramya, Pandurangan and Ganapathy, 2019; Pandurangan, Veeraiyan and Nesappan, 2020; [No title], no date) over the past 5 years. The plan for this study stemmed from the contemporary interest in our community.

Tooth wear is recognized as a worldwide increasing problem, especially in the elderly population (Liu *et al.*, 2014). Surface of tooth loss is an apparent irreversible process that accumulates with age (Rashid, Hanif and Nasim, 2015). In the present study, among 58 patients of tooth wear were explored based on gender, age groups, arch. We observed that 31 (53.4%) were males and 27 (46.6%) were females. Males

were more prevalent than females (Figure 1). The results were concurrent with other studies done by Hugoson et al., Seligman et al., Donachie et al., Yadav (Hugoson et al., 1988; Seligman, Pullinger and Solberg, 1988; Donachie and Walls, 1995; Yadav, 2011). The most common age group with incidence of tooth wear is between 61 to 70 years of age (39.7%) and least prevalence of tooth wear among 20-30 years (8.6%) (Figure 2). Similar results were seen in a previous studies of Johansson, Olaf Bernhardt et al., Van't Spijker et al., Lie et al., Wetselaar et al., Thippanna et al (Johansson, 1992; Olaf Bernhardt et al., 2004; Van't Spijker et al., 2009; Liu et al., 2014; Wetselaar et al., 2016; Thippanna and Ramu, 2017) with the mean age of above 50 years of age. There was an incongruent with the studies conducted by Hugoson et al., Pergamalian et al., Bartlett et al (Hugoson et al., 1988; Pergamalian et al., 2003; Bartlett et al., 2013).

In this present study, patients with tooth wear were analyzed according to Turner and missirlian classification, Category 2 is the most common in tooth wear followed by category 3 and category 1 (Figure 3). The results of the present study, Healthy condition of patients (77.6%) was more prevalent in tooth wear when compared to systemic condition of patients (22.4) (Figure 4). This study is contradictory with the studies of Yadav, Wetselaar et al., Srisilapanam et al (Yadav, 2011; Wetselaar et al., 2016; Srisilapanam, Jindarat and Roseman, 2018). The results of this study, we observed that females (43.10 %) were more prevalent in healthy patients and least prevalent were females (3.45%) in systemic patients. There is a significant association between the gender and health status ($P= 0.011$) (Figure 5). Male were more prevalent among 61-70 years of age (29.31%) In this study, tooth wear showed a not significant correlation ($P = 0.101$) between gender and age (Figure 6). Category 2 was more prevalent in patients among 61-70 years of age with a percentage of 27.59%., there is no significant association between the age and Turner and Missirlian classification ($P=0.189$) (Figure 7). In the present study, tooth wear shows no significant correlation between gender and Turner and Missirlian classification ($P= 0.541$) (Figure 8). Wear and tear of teeth is an increasing problem in elderly and young patients worldwide. However, dental professionals should be aware of the fundamental cause and governing factors of tooth wear to manage patients with a worn dentition (Lee et al., 2012).

The limitations of the present study is the small sample size. it was conducted in an institution-based set-up and a single centered study was used. It does not include other ethnics populations. Hence, further study to assess the dietary status, nutritional status and systemic condition in the larger sample size in multicentre aspects.

CONCLUSION

Within the limits of the present study, the study concludes that tooth wear is more prevalent among 61- 70 years of age and it is more prevalent among males when compared to females. A challenge in clinical dental practice, there are a variety of treatment choices associated with aetiology, diagnosis and management. Preventive protocols should increase the community awareness regarding tooth wear and dietary habits.

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AUTHOR CONTRIBUTIONS :

Author 1 (Gayathri R Menon), carried out the study by collecting data and drafted the manuscript after performing the necessary statistical analysis. Author 2 (Dr. Kiran Kumar Pandurangan) aided in conception of the topic, has participated in the study design, statistical analysis and has supervised in preparation and developing the manuscript.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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GRAPHS

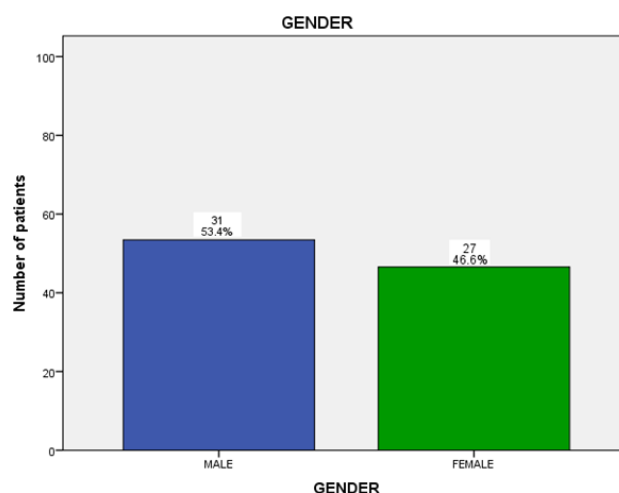


Figure 1: Bar graph depicting the gender wise distribution among patients with tooth wear. X axis denotes gender and Y axis denotes number of patients with tooth wear. Blue bar denotes male gender and green bar denotes female gender. Male (53.4%) showed higher prevalence than females (46.6%).

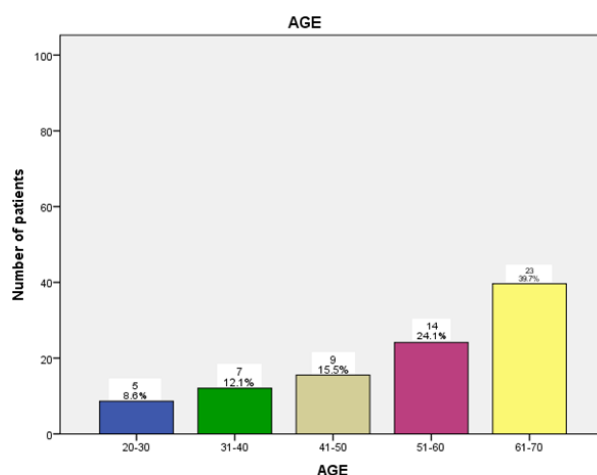


Figure 2: Bar graph depicting the age wise distribution of patients with tooth wear. X axis represents age groups and Y axis represents number of patients with tooth wear. Blue bar denotes 20-30 years of age (8.6%), green bar denotes 31-40 years of age (12.1%), brown bar denotes 41-50 years of age, purple bar

denotes 51-60 years of age and yellow bar denotes 61-70 years of age (39.7%). Among the age groups 61-70 years (39.7%) showed higher prevalence.

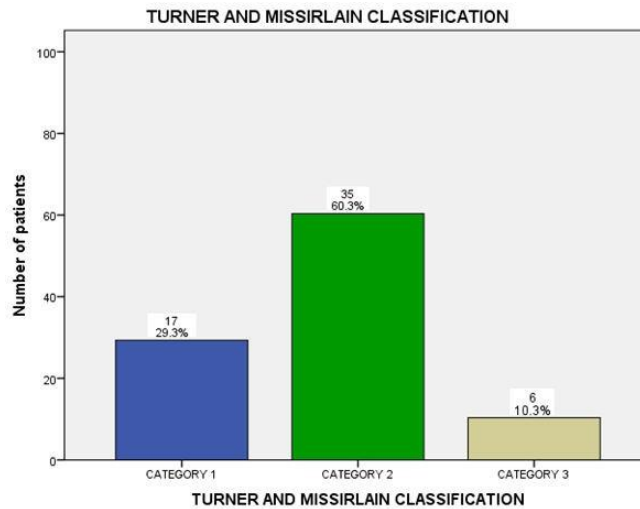


Figure 3: Bar graph depicting the distribution of turner and missirlian classification among the patients with tooth wear. X axis represents turner and missirlian classification and Y axis represents number of patients with tooth wear. Blue bar denotes category 1 (29.3%), green bar denotes category 2 (60.3%) , brown bar denotes category 3 (10.3%). Among the categories, Turner and Missirlian category 2 (60.3%) was more prevale

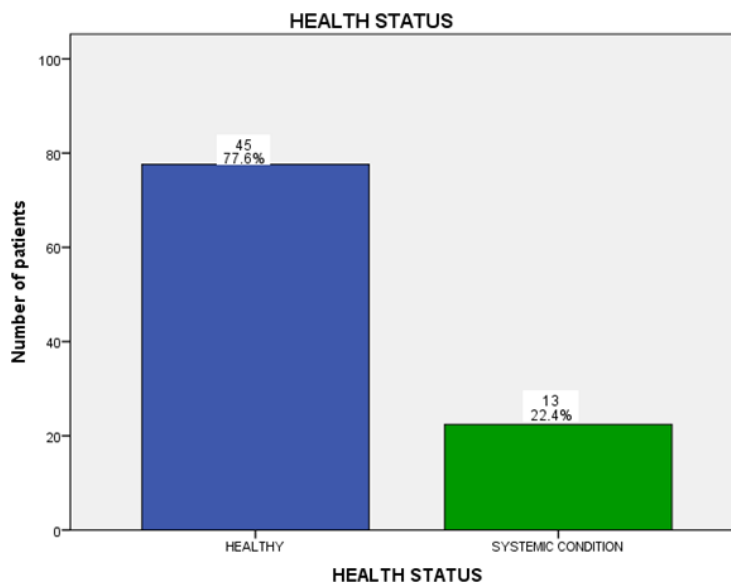


Figure 4: Bar graph depicting the distribution of health status of patients with tooth wear. X axis represents health status and Y axis represents number of patients with tooth wear. Blue bar denotes healthy patients (77.6%), green bar denotes systemic patients (22.4%%). Patients with tooth wear were healthy (77.6%).more prevalent than systemic patients.

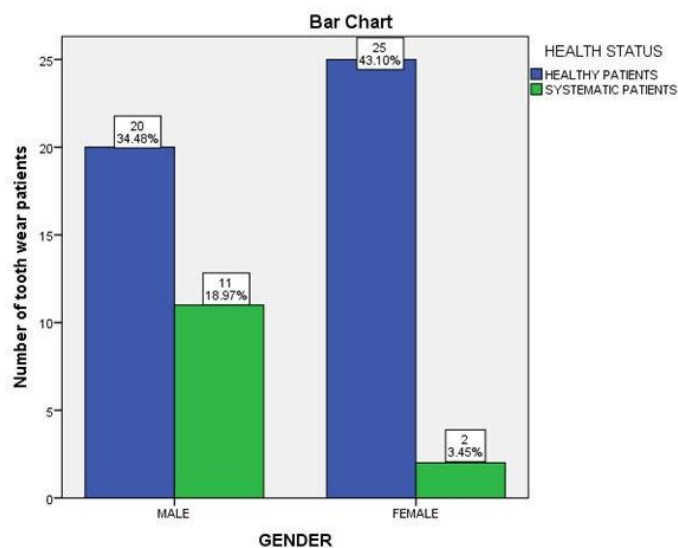


Figure 5: Bar graph depicts the correlation between gender and health status. X axis represents different genders of the patients and Y axis represents the number of patients with tooth wear. Blue bar denotes healthy patients and green bar denotes systemic patients. 43.1% of females were healthy patients and least 3.45% of females were systemic patients. Pearson's Chi square test shows the p value 0.011 (p value < 0.05 which shows statistically significant). From the graph we can infer that female patients with tooth wear present were mostly healthy (43.10%).

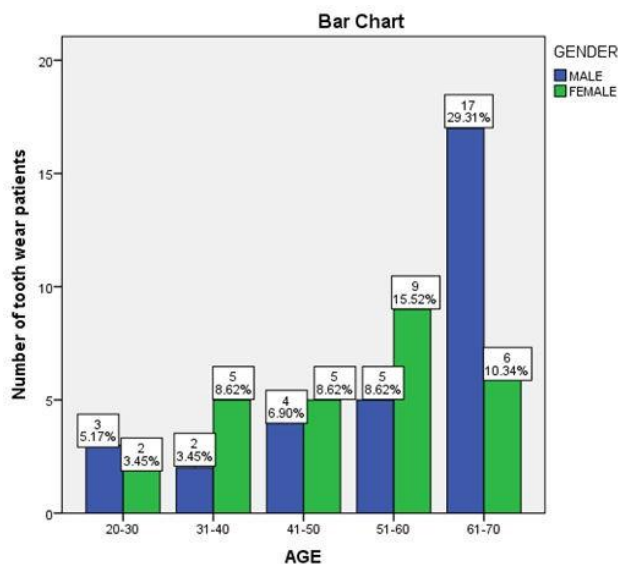


Figure 6: Bar graph depicting the correlation between gender and age. X axis denotes age of the patients and Y axis denotes the number of patients with tooth wear. Blue bar denotes male green bar denotes female. Male patients were more prevalent among 61-70 years of age commonly affected with tooth wear with a percentage of 29.31%. Pearson's chi square test shows the p value 0.101 (p value > 0.05 indicating statistically not significant).

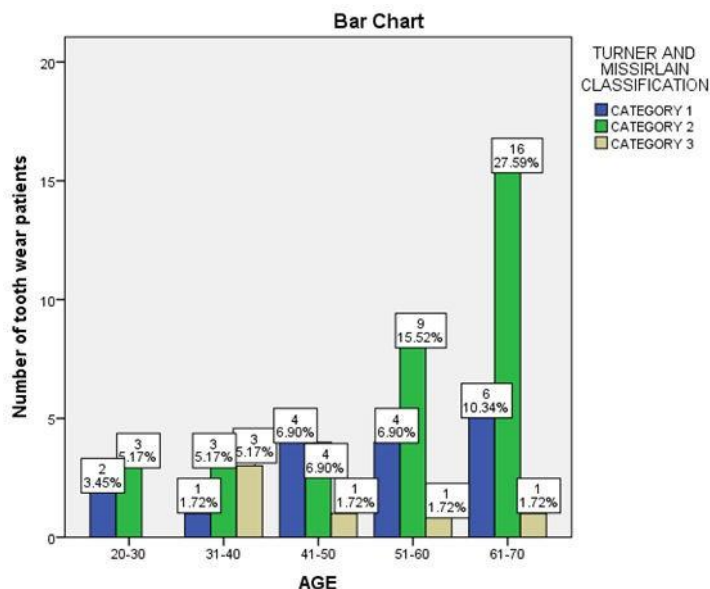


Figure 7: Bar graph depicts the correlation between age and turner and missirlian classification. X axis represents age of the patients and Y axis represents the number of patients with tooth wear. Blue bar denotes category 1, green bar denotes Category 2 ,brown bar denotes Category 3. Category 2 was more prevalent in patients at the age 61-70 years with a percentage of 27.59%. Pearson’s Chi square test shows the p value 0.189 (p value >0.05 indicating statistically not significant).

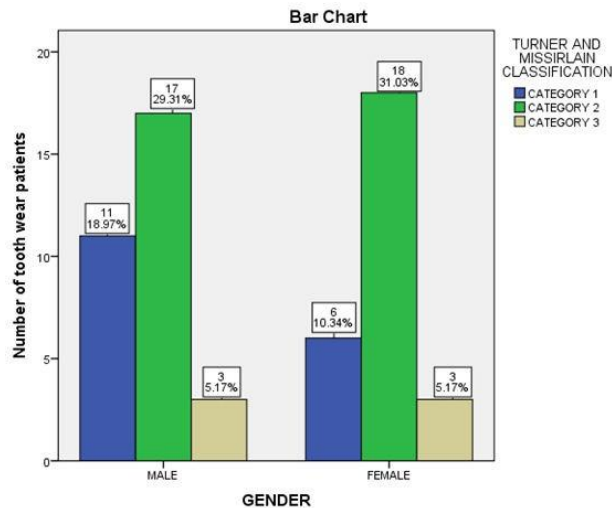


Figure 8: Bar graph depicting the correlation between gender and turner and missirlian classification. X axis denotes gender and Y axis denotes the number of patients with tooth wear. Blue bar denotes category 1, green bar denotes category 2 ,brown bar denotes category 3. Category 2 was more prevalent in both genders. Pearson’s Chi square test shows the P value = 0.541 (P value >0.05 which shows statistically not significant)