Association between gender and deep pit and fissure among index age group 35-45 years

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ABSTRACT

Dental caries is a well-known factor leading to various dental complications, affecting both the health and quality of life. Type of pit and fissures such as "V" and "K" are more susceptible to dental caries where mechanical cleaning becomes a challenge. This study is conducted to evaluate the association of gender with deep pit and fissure among the Index age group 35-44 years old. A retrospective cross-sectional study was conducted using the patient records of the University hospital. A total of 103 consecutive case records of patients who underwent pit and fissure sealant were retrieved and analysed. Descriptive statistics were done to find the prevalence and association of gender and deep pit and fissures among the index age group. The number of teeth with bottomless pit and fissures was higher in males (52.43%) than in females (47.57%). Also, individuals of age group 35-40 years had a larger number of teeth with deep pit and fissures (74.75%) than the age group 41-45 years. No significant association was found between gender and the number of deep pits and fissures (p>0.05). The proportion of deep pit and fissures was high in males compared to females.

INTRODUCTION

World Health Organization (WHO) pertaining important attention to oral health and the prevalence and factors leading to oral diseases including dental caries and periodontal diseases as well as oral cancer since the last decade (Petersen, 2003) among children and adults. Dental caries and periodontal diseases likely to develop due to lifestyle habits (Mohapatra et al., 2019). Many healthy promoting lifestyles that can be practised daily to improve oral health and prevent oral diseases are infrequent sugar consumption, tooth brushing effectively and regularly at least twice a day, regular use of dental floss and six months visit to the dentist. Knowledge in oral health in adults and parents' attitudes regarding this matter aid in promoting children's oral health behaviour (Okullo et al., 2004; Qiu et al., 2013).

Evidence suggests that susceptibility to decay is related to the different types of occlusal morphologies (Nagano, 1960; König, 1963). Development of dental caries is likely to develop on pits and fissures on occlusal surfaces of permanent teeth (Prabhakar et al., 2011). Dental caries are susceptible due to morphology of the tooth pits and fissures, which can be a flourishing region for microorganisms and make the hygiene practices of these areas
difficult to contribute to greater plaque aggregation (Axelsson, 2002). Fissure sealant application is recommended in order to prevent dental caries, in case of samples observed in pits and fissures that are very deep and narrow (Kannan et al., 2017). This is to create a physical barrier for the accumulation of plaque in these particular anatomical areas of the tooth (Mathew et al., 2020; Daniel et al., 2008). Dental caries formation can be avoided as this highly suggested primary prevention measure not only prevents caries but also to govern and halt the development of incipient dental caries (Narvai, 2006; Khatri et al., 2019; Rose, 2001). Fissure sealants are used frequently as a primary preventive measure in dental management (Tellez et al., 2011; Prabakar et al., 2018b; Mathew et al., 2020).

Natural cleaning mechanisms through the tongue, lips, and cheeks during chewing and swallowing during tooth eruption are absent (Carvalho, 2014) due to the deprived ability to clean occlusal surfaces of erupting teeth are particularly affected (Prabakar et al., 2016). Accumulation of bacteria and food residues occur in these areas, forming a biofilm, and lead to demineralization and caries (Li et al., 2011; Pratha and Prabakar, 2019). Multiple risk factors, such as gender, oral hygiene and dietary habits (Kannan et al., 2017) contribute to the prevalence of caries in a population (Sevekar et al., 2012; Griffin et al., 2005). Moreover, the occurrence of caries tends to surge increasing age as it is a cumulative process (Kannan et al., 2017).

Oral health community programs (Pavithra and Jayashri, 2019) have included fissure sealants as they are deliberated to be an effective and economical method for primary prevention of dental caries (Mullan et al., 1984; Prabakar et al., 2018a). Tooth decay in occlusal surface is mainly prevalent in developing countries due to the diet, oral habits (Harini and Leelavathi, 2019; Neralla et al., 2019), socioeconomic conditions and a lack of education (Kulkami and Deshpande, 2002). The sequence and pattern of carious lesions demonstrate a surface hierarchy in susceptibility to decay, with pit and fissure surfaces exhibiting much greater risk than smooth surfaces (Batchelor and Sheiham, 2004). The fissure becomes susceptible to caries since its base is very close to the dentin-enamel junction and often non-cleansable mechanically. This study aimed to assess the association of gender and deep pit and fissures among the Index age group 35-44 years old.

MATERIALS AND METHODS

Study setting and design

A retrospective study was conducted to find out the association between gender and deep pit and fissures. The study was employed by reviewing 86,000 records of patients visiting the author’s University hospital from June 2019 to March 2020.

Selection criteria

A total of 4375 records with signed informed consent were sorted. Case records with the preventive procedures such as pit and fissure sealants and preventive resin restorations done were filtered. Of which 103 case records of patients aged 35-45 years with only pit and fissure sealants done were retrieved. We took an effort to confirm case records of patients with systemic diseases, physical and mental disabilities were excluded from the selection process with the help of an external reviewer.

Data collection

Data on patients’ age, gender and number of deep pit and fissures (indirectly a number of pit and fissure sealants) were collected and entered into excel spreadsheet. Age of the patients was categorized into 35-40 years and 41-45 years for the convenience of statistical analysis.

Statistical analysis

Collected data was subjected to statistical analysis using SPSS version 20.0. Frequency distribution was performed to find the proportion of the number of deep pit and fissures based on age and gender. Chi-square association was done to find the association between gender and deep pit and fissures.

RESULTS AND DISCUSSION

This study involved 103 adults who reported in the outpatient department of the University hospital.

Figure 1 showed most of the patients were in the age group 35-40 years (74.76%). Among the patients, 52.43% were males and 47.57% were females (Figure 2). Most of the patients (93.2%) had 1-5 teeth with deep and fissure sealants (Figure 3). Figure 4 showed that most of the patients (69.9%) with age group 35-40 years had 1-5 teeth with deep pit and fissures and most of them (23.3%) in 41-45 years had 6-10 teeth with deep pit and fissures. However, the association between age and deep pit and fissures was not statistically significant in Fisher’s exact test (p=1.000). About 50.5% and 42.72% males and females had 1-5 teeth with deep pit and fissures. The association between gender and deep pit and fissures was not statistically significant in Fisher’s exact test (p=0.283).

The present study observed that the number of teeth with deep pit and fissure was declining as age
increases due to mechanical tooth wear. In contrast with the current study, the prevalence of adults with deep pit and fissures was increasing in older individuals, as stated by the (National Institute of Health, 2018). Another study, in contrast with the present study, showed a higher prevalence of deep pit and fissures in females than males (Veiga et al., 2015). One other study presented a declining frequency in the prevalence of deep pits and fissures in older patients (Abbass et al., 2019) which is inconsistency with the present study. The tooth morphology with deep pit and fissures among males and females can be attributed to genetic phenotyping. Also, mechanical wear may contribute to the decreasing proportion of deep pit and fissures among the 41-45 years age group.

Figure 1, X-axis denotes age groups in years, and Y-axis denotes the count of patients in each age group. Violet represents the age group 35-40 years and pink color represents the age 41-45 years. Most of the patients were in the age group 35-40 years.

Figure 2, X-axis denotes dichotomized nominal variable gender and Y-axis denotes the count of male and female patients. Green represents males and yellow represents females. Males predominated the study population.

Figure 3, X-axis represents the number of deep pit and fissures. The Y-axis represents the count for the number of pit and fissures. Red color represents 1-5 teeth with deep pit and fissures and blue color represents 6-10 teeth with deep pit fissures. Most of the patients had 1-5 teeth with deep pit and fissures.

Figure 4, X-axis denotes age group in years. Y-axis denotes the percent for the number of pit and fissure sealants. Blue represents 1-5 teeth and red indicates 6-10 teeth with deep pit and fissures. Most of the patients in both age groups had 1-5 teeth with deep pit and fissures. However, the association between age and deep pit and fissures was not statistically significant in Fisher’s exact test (p=1.000)(p>0.05).

Figure 5, X-axis denotes dichotomous nominal vari-
able gender and Y-axis denotes the count for the number of deep pit and fissures. Red indicates 1-5 teeth with deep pit and fissures and blue color indicates 6-10 teeth with deep pit and fissures. The association between gender and deep pit and fissures was not statistically significant in Fisher’s exact test (p=0.283); (p>0.05). Males had more deep pit and fissures than females.

**Figure 5: Cluster bar chart association of gender and deep pit and fissures.**

In our study, most of the patients underwent at least one deep pit and fissure treated with sealant application and maximum nine sealants application reported in a few patients. One study presented one sealant treatment done for each patient as early preventive management (Veiga et al., 2015). A similar study reported placement of sealing materials on occlusal surfaces, reported deprivation in caries incidence compared to unsealed control groups (Cvikl et al., 2018). One other study reported a reduction in caries prevalence for an observation period of 15 years reported in all posterior teeth that were sealed (Jodkowska, 2008).

Pit and fissures sealant application is considered as more effective the earlier the treatment is done. Thus, early preventive management of deep pits and fissure caries should be implemented in childhood itself to prevent caries development in the adult population. Thus, pit and fissure sealant application must be one of the goals in public health programs. The parents especially must be educated regarding early caries management so that the teeth can be protected from dental caries initiation, particularly in young permanent teeth (Prabakar et al., 2016). Dental services in village areas must be improved with the help of village health workers and public-private partnerships to improve the provided services may be considered as a long-term goal. The application of primary preventive methods, namely fissure sealant application, (Prabakar et al., 2018b) in the dental appointment, complemented with oral health education, will undoubtedly reduce the financial impact of oral treatments in the population and will ensure a reduction in the risk of oral disease progression during adulthood.

The present study had few limitations where type of deep pit and fissures “V” or "K" would have been taken into account. Genetic and environmental (physical anthropology) variations play a significant role in the morphology of teeth.

**CONCLUSIONS**

Within the limitations of our study, it has shown that the prevalence of deep pit and fissures was high in males compared to females. Therefore, health programs should include the mantle of creating awareness on preventive oral health services among all index age groups.

**Conflict of Interest**

The authors declare that they have no conflict of interest for this study.

**Funding Support**

The authors declare that they have no funding support for this study.

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