

THE USE OF PIT AND FISSURE SEALANT AMONG ADULT POPULATION - A RETROSPECTIVE STUDY

B. John Rozar Raj¹, Samuel Raj Srinivasan², Niveditha.M.S³

¹*Saveetha Dental College and Hospitals, Saveetha Institute Of Medical and Technical Science,
Saveetha University, Chennai, India*

²*Reader, Department of Public Health Dentistry, Saveetha Dental College and Hospitals, Saveetha
Institute Of Medical and Technical Science, Saveetha University, Chennai, India*

³*Professor and Head of academics Dept of Conservative dentistry and Endodontics Saveetha Dental
College and Hospitals, Saveetha Institute Of Medical and Technical Science, Saveetha University,
Chennai 77*

¹151501065.sdc@saveetha.com

²samuelrajs.sdc@saveetha.com

³nivedhitha@saveetha.com

ABSTRACT

The term pit and fissure sealant describes the material that is introduced into the occlusal pits and fissure of teeth, thus forming a protective barrier and prevents the development of caries. The aim of the study was to assess the use of pit and fissure sealants in the adult population. This was a retrospective study and records were assessed from patients visiting dental college from June 2019 to March 2020. Data of pit and fissure sealants performed on patients above the age of 18 years was collected. Excel tabulation was done. SPSS was used to analyze the data and summarize the results. In this present study, pit and fissure sealants were used in 4379 adult patients. Pit and fissure sealant was used more between the age group of 18 to 30 years and most commonly in maxillary first molar. Pit and fissure sealant was used more in maxillary arches with the percentage of 55.2%. Distribution of pit and fissure sealant was used more in male patients with a percentage of 55.2%. From the present study, we can conclude that pit and fissure sealant were used more between the age group of 18 to 20 years. And sealant application was more predominant on maxillary first molar compared to other teeth.

Keywords

Caries, Maxillary first molar, Pit and fissure sealants

INTRODUCTION

Dental caries is a pandemic disease affecting all populations irrespective of age, gender or socioeconomic status (Petersen, 2004), Dental caries have detrimental effects on quality of life. Caries not only affects oral health but also leads to a loss of confidence and mental health problems. Its prevalence is alarming in developing countries due to lack of access to oral health services and lack of awareness about preventive measures (Moynihan and Petersen, 2004)

The pits and fissures are considered to be at greater risk for dental caries as the control of accumulation and removal of dental plaques in these deep areas are challenging (Brown *et al.*, 1996). Various studies assumed that preventive interventions, such as the addition of fluoride to water and toothpaste as well as topical fluoride application, more effectively reduce caries on smooth surfaces than in pits and fissures (Sanders, Feigal and Avery, 2011).

The plaque retentive nature of pit and fissure make them difficult to clean, thereby causing them to be more susceptible to caries than smooth surfaces and possibly not to be protected by fluoride administration (Kitchens, 2005). Lower molars are reported to be more prone to caries than anterior teeth and most affected teeth in the entire dentition (Hopcraft and Morgan, 2006). T

The term pit and fissure sealant describes the material that is introduced into the occlusal pits and fissure of teeth, thus forming a protective barrier that obstacles the contiguity between the area most susceptible to dental caries and oral microenvironment. They are basically the first line of defence against caries. The pit and fissure sealants are mostly fluorinated to perform better in caries prevention. The first pit and fissure sealant, “Nuva-Sed” was marketed in 1972. Since then, various have documented the effectiveness of sealants in preventing pit and fissure caries (on Dental Materials and Devices., 1972).

The application of sealants should be recommended at the first stage of eruption and they may arrest the progression of non cavitated occlusal dentinal caries. Sealant application is a preventive conservative approach involving the introduction of sealants into the pit and fissure of caries prone teeth, this sealant makes them bond to the tooth micro mechanically, providing a physical barrier that keeps bacteria away from their source of nutrients (Simonsen, 1978). A number of clinical studies indicate that the success of pit and fissure sealants protective role depends on different aspects, the most relevant of which are the properties of the sealant materials, the maintenance of sealant integrity and the level of sealant retention.

Previously our team had conducted numerous clinical trials and studies (Prabakar, John, I. Arumugham, *et al.*, 2018; Neralla, Jayabalan and George, 2019; Pavithra, Preethi Pavithra and Jayashri, 2019) randomized control trials (Prabakar, John, I. M. Arumugham, *et al.*, 2018b; Khatri *et al.*, 2019; Pratha, Ashwatha Pratha and Prabakar, 2019; Mathew *et al.*, 2020; Samuel, Acharya and Rao, 2020) and surveys (Prabakar, John and Srisakthi, 2016; Kannan *et al.*, 2017) and isotopic study (Kumar and Preethi, 2017; Kumar and Vijayalakshmi, 2017) and systematic reviews (Leelavathi and Others, 2019) and in-vitro studies (Prabakar, John, I. M. Arumugham, *et al.*, 2018a; Mohapatra *et al.*, 2019) over the past 5 years. Now we are focussing on epidemiological surveys.

One of the hindrances for the adoption of primary dental care is lack of public awareness. The fundamental step to promote the utilisation of preventive care is to increase the awareness and attitude of patients regarding the significance of such practices,

The aim of this study was to assess the use of pit and fissure sealants among the adult population in an institutional set up in chennai city.

MATERIALS AND METHODS

This was a retrospective study and all the records of patients visiting saveetha dental college from June 2019 to March 2020 were assessed to assess the prevalence of pit and fissure sealant preventive treatment among 18-30 year olds. This study was conducted at saveetha dental college and hospital, chennai and ethical approval was obtained from the institutional IRB. Informed consent was obtained from all the subjects during examination that the data collected might be used to further scientific research. All cases above 18 years were included in the study. Cross verification was done by pictures. Sampling bias was minimised by convenience sampling. Data was entered in an excel sheet and analyzed for accuracy by cross checking in a methodical manner. Data was entered in microsoft excel and further analyzed in SPSS, V23, IL, CH. Incomplete data in the dental records were excluded from the study and the validity of the dental records were verified by comparing with the treatment procedure photograph. Descriptive statistical test was done using SPSS software. Independent variables were gender, age and number of teeth sealed. Dependent variables were pit and fissure sealants. Descriptive analysis was done and the mean age difference between maxillary and mandibular sealants group were assessed using an independent T test. $P < 0.05$ was considered significant

RESULTS AND DISCUSSION

In the present study, pit and fissure sealants were used in 4379 adult patients. Figure I showed the distribution of pit and fissure sealant tooth wise based on age categories. Distribution of pit and fissure sealant was more among the age groups of 18 to 30 years. Pit and fissure sealant was used less among the age group of 45 to 55 years. Pit and fissure sealants are always recommended during the first stage of the eruption so they might arrest the progression of non cavitated dentinal caries. It is usually not very much recommended for elderly people. Pit and fissure sealant was used more in the maxillary first molars among all age groups. Percentage of pit and fissure sealants used in maxillary first molars among all age groups was 19.60%. Pit and fissure sealants were not used very less in third molars and premolars among all age groups with the percentage of 2.2%. In the study by Cvikl.et.al (Cvikl and Bekes, 2018), pit and fissure sealant was used more in the younger age group. This was very much similar to our study. In another study by Miao.et.al(Miao, Jiang and Li, 2007), it was used more in mandibular first molars while in our study it was used more in maxillary first molars.

Figure 2 showed the distribution of pit and fissure sealant based on maxillary and mandibular arches and age groups. Pit and fissure sealant was used more in maxillary arches with the percentage of 60%. Pit and fissure sealant was used more in maxillary arches among the age groups of 18 to 30 years and 31 to 45 years. In the age group of 46 to 55 years, pit and fissure sealant was used slightly more in mandibular arches. Percentage of pit and fissure sealant used in the mandibular arch was 40%. In the study done by Aldorsary.et.al (Aldossary *et al.*, 2018), there was no significant difference in the presence of pit and fissure sealants between maxillary and mandibular arches.

Figure 3 showed the gender distribution. Pit and fissure sealants were used more in male patients with a percentage of 55.2%. Percentage of pit and fissure sealants used in female patients was 44.8%. In the study by Maweri.et.al(Al-Maweri *et al.*, 2016), there was no significant difference between male and female patients.

Figure 4 showed the mean age of teeth in maxillary and mandibular arches in which pit and fissure sealant application was done. Mean age of teeth in the maxillary arch was 26.8372. Mean age of teeth in the mandibular arch was 25.2553. Mean age of teeth was found to be more in the maxillary arch.

The findings of the present study add to the consensus of the previous study. Limitations of the study were smaller sample size, so it doesn't provide results of the entire population. Further studies can be performed with the larger population other factors like different sealant types and level of sealant retention can be analysed. Proper follow up can be done

CONCLUSION

From the present study, we can conclude that the pit and fissure sealants were used more commonly in males in the age group of 18 to 30 years and more commonly in maxillary first molars. Pit and fissure sealants were used more in maxillary arch when compared to the mandibular arch.

AUTHOR CONTRIBUTIONS

First author (B.John Rozar Raj) performed the analysis, interpretation and wrote the manuscript. Second author (Dr.Samuel Raj Srinivasan) contributed to conception, data design, analysis, interpretation and critically revised the manuscript. Third author (Dr. Niveditha.M.S) participated in the study and reviewed the manuscript. All the three authors have discussed the results and contributed to the final manuscript.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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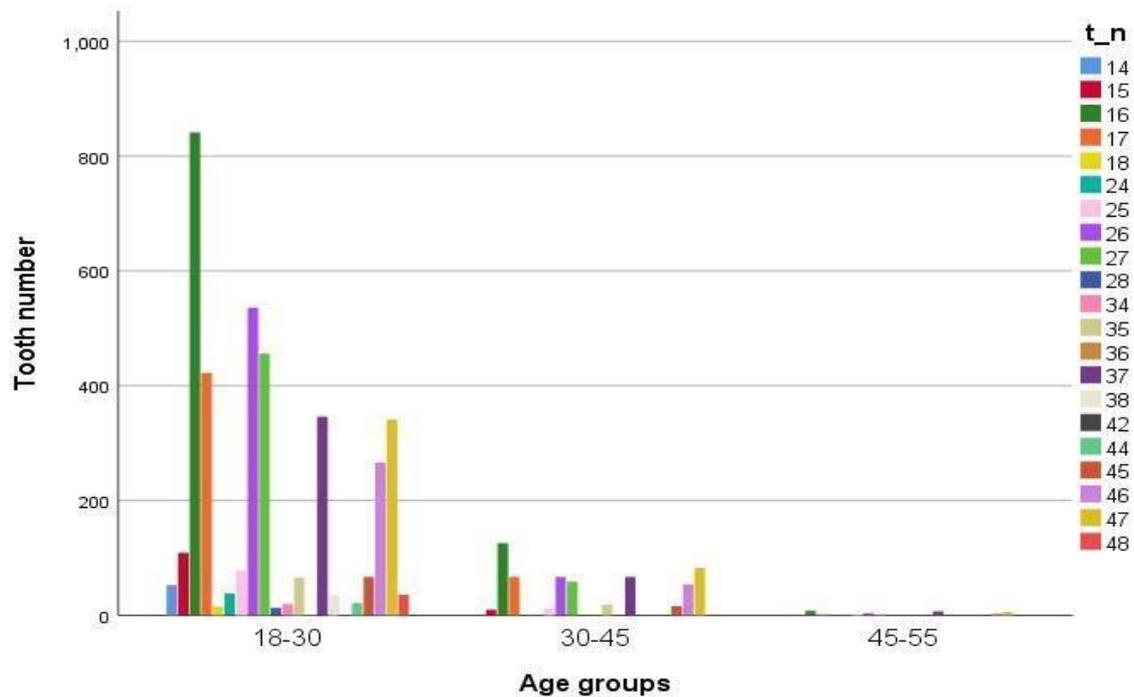


Figure 1 : Bar chart depicts distribution of pit and fissure sealant tooth wise based on age categories. X-axis denotes age groups. Y-axis denotes the tooth number. This chart showed that the pit and fissure sealants were distributed more among the age groups of 18 to 30 years and were used more in the maxillary first molars.

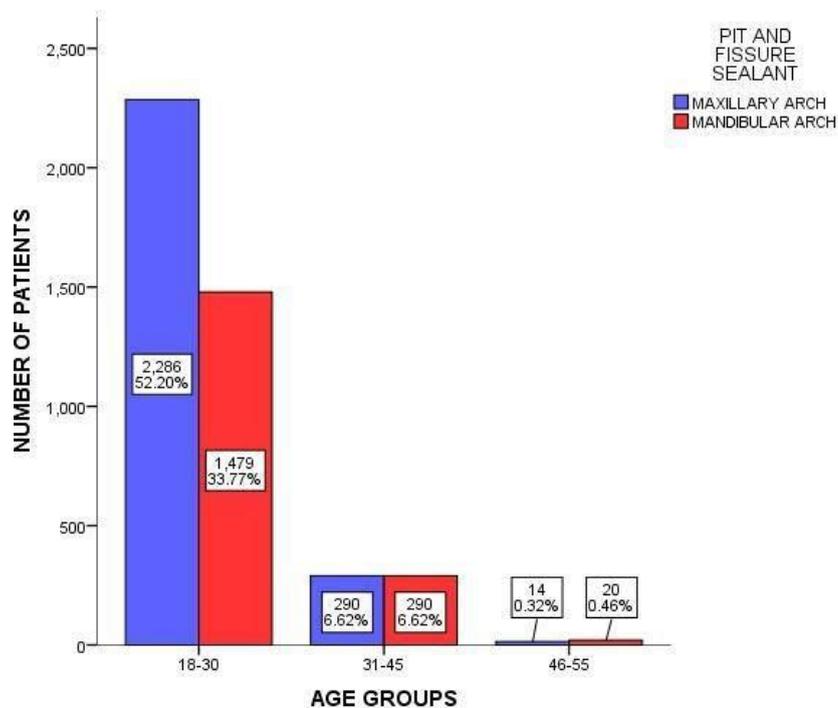


Figure 2: Bar chart depicts the distribution of pit and fissure sealant based on maxillary and mandibular arches and age. X-axis denotes the age groups. Y-axis denotes the number of patients. Chi square test was done and was found to be statistically significant (Pearson chi square, p value- 0.001; <0.05). This chart showed that the pit and fissure sealant was used more in maxillary arches (Blue) in the age groups of 18 to 30 years and 31 to 45 years and there was statistically significant difference among various age groups.

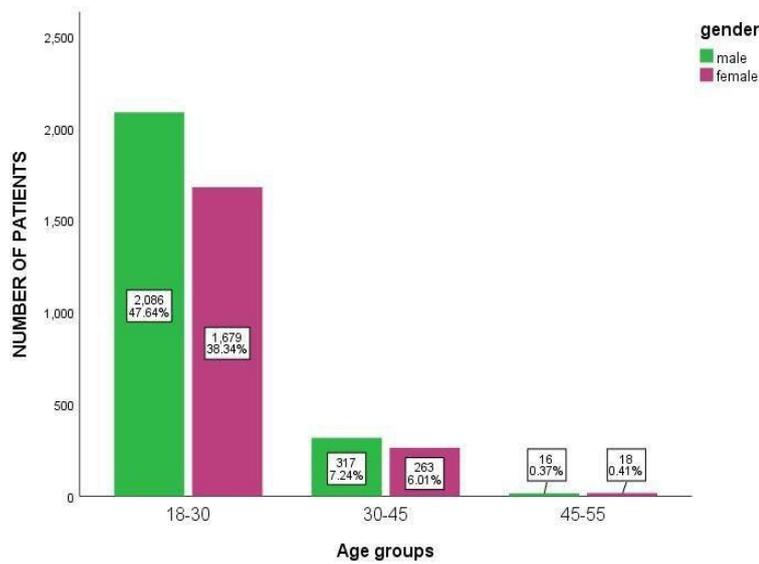


Figure 3: Bar chart depicts the association between gender and the age groups in patients who underwent pit and fissure sealant application. X-axis denotes the age groups. Y- axis denotes the gender. Chi-square test was done and was found to be statistically not significant.(Pearson chi square, p value- 0.59; (>0.05). This chart showed that the pit and fissure sealants were used more in male patients(green) and there was no statistically significant difference.

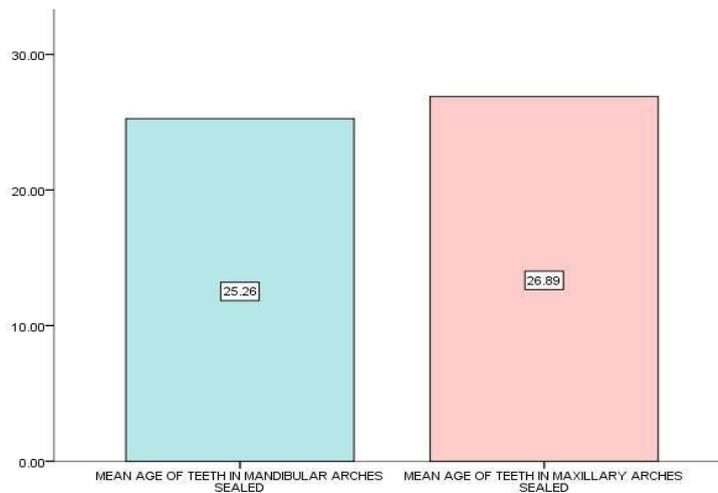


Figure 4: Bar chart depicts the mean age of teeth in maxillary and mandibular arches in which pit and fissure sealants were used. (Independent T-test was done, P value- 0.001;(<0.05) hence statistically significant). Mean age of teeth was found to be more in the maxillary arch and there was a statistically significant difference.