Abstract: Dental restoration restores the parts of the tooth structure and missing teeth. An economic, stable and aesthetic restorative material for posterior teeth as an alternative to silver amalgam has long eluded the dental profession. It has been used for more than 150 years and constitutes approximately 75% of all restorative materials used by dentists. Both composite and amalgam are considered to be suitable direct filling materials for restoring class 1 and 2 cavities. Nowadays, the use of amalgam is reducing and gradually composite resin is expected to replace it in near future. The purpose of the study was to evaluate the association of age and gender of patients who underwent amalgam restoration in maxillary second premolar with class 1 cavity. This is a descriptive study which was performed under a university setting in the year 2020. The data of patients who underwent amalgam restoration in the second maxillary premolars from June 2019 to March 2020 was collected by reviewing patients records and analysing data of 86000 patients. The collected data was compiled, reviewed, tabulated and entered in SPSS software for statistical analysis. The study showed a female predilection (64%) and class 1 amalgam restoration in maxillary second premolar were common in patients of 34 years of age. There is no significance of age and gender. Within the limits of the study, it is evident that class 1 amalgam restorations in the maxillary second premolars were more common among the patients of 34 years of age and prevalent among the females. The study also showed that males of 41 years of age and females of 34 years of age were commonly found to have class 1 amalgam restoration in maxillary second premolars. Chi square test was done and Pearson chi square value was found to be p=0.462; hence statistically not significant (p>0.05).

Keywords: Amalgam restoration, Class 1 cavity, Maxillary second premolar, Age, Gender.

INTRODUCTION

Dental restorations restores the parts of the tooth structure and missing teeth. An economic, stable, and esthetic restorative material for posterior teeth as an alternative to silver amalgam has long eluded the dental profession (Ahmad, 2008; Ramamoorthi, Niveditha and Divyanand, 2015; Ramanathan and Solete, 2015). Dental amalgam, which is one of the most commonly used restorative materials, is one of the most versatile restorative materials used in dentistry. It has been used for more than 150 years and constitutes approximately 75% of all restorative materials used by dentists (Brigato et al., 2009; Janani, Palanivelu and Sandhya, 2020; Jose, P. and Subbaiyan, 2020). Dental amalgam is proven to be a reliable material for long term load bearing situations and is cost efficient making it unmatched by other dental restorative material. It has low technique sensitivity, better self-sealing property and longevity (Manohar and Sharma, 2018; Nasim and Nandakumar, 2018; R, Rajakeerthi and Ms, 2019). There is still no adequate economic alternative for dental amalgam due to its high compressive strength. Composition of amalgam which is currently used, is an alloy composed of silver 40–70%, tin 12–30% and copper 12–24%. It may also include indium 0–4%, palladium 0.5% and zinc up to 1%. The reason for the lower mercury emission from amalgam is that it is prepared with indium which rapidly forms indium oxide and tin oxide films which in turn reduce mercury release (Hollenback, 1970; Levey, Carson and Innes, 2015).

In a study by O’Brien, composite restorations were compared equally to amalgam (O’Brien, 1997; Rajendran et al., 2019). Both, composite resin and amalgam are considered suitable direct filling materials for restoring class I and II cavities (Bernardo et al., 2007; Nasim et al., 2018). Nowadays, the use of amalgam is reducing and gradually composite resin is expected to replace it in the near future (Opdam et al., 2007; Teja and Ramesh, 2007).
2019). Amalgam restorations do not bond chemically to tooth or completely seal the prepared cavities (Kidd, 1976). On exposure to the oral environment, the newly placed amalgam restoration is subjected to corrosion, and the products of this corrosion are deposited in the gap resulting in microleakage (Ben-Amar, Cardash and Judes, 1995). But, from longitudinal clinical studies on posterior restorations with an observation period of 8 years or more, reveal a wide range of annual failure rates of 1% to 6% as compared to amalgam restorations which is 0–7% (Manhart and Hickel, 1999; Pallesen and Qvist, 2003; Ravinthar and Jayalakshmi, 2018). Most retrospective studies show that amalgam has a lower failure rate than dental composite (Mjör, Dahl and Moorhead, 2000; Fernández et al., 2015; van de Sande, 2016; Siddique et al., 2019). The satisfactory functioning of the amalgam restorations over a long period of time is due to the prevention mechanical failure of amalgam restorations such as marginal fracture, bulk fracture and tooth fracture (Anusavice, 1988; Letzel et al., 1997; Kumar and Delphine Priscilla Antony, 2018). Amalgam has been widely used as a posterior restorative material and the reported cases of hypersensitivity to amalgam are relatively infrequent (Noor and Others, 2016). By far the most common type of hypersensitivity reaction may be the delayed oral lichenoid reaction (OLR) (Jolly et al., 1986; Eley, 1997; Teja, Ramesh and Priya, 2018). Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Deogade, Gupta and Ariga, 2018; Ez hilarasan, 2018; Ez hilarasan, Sokal and Najimi, 2018; Jeevanandan and Govindaraju, 2018; J et al., 2018; Menon et al., 2018; Prabakar et al., 2018; Rajeshkumar et al., 2018, 2019; Vishnu Prasad et al., 2018; Wahab et al., 2018; Dua et al., 2019; Duraisamy et al., 2019; Ez hilarasan, Apoorva and Ashok Vardhan, 2019; Gheena and Ez hilarasan, 2019; Malli Sureshbabu et al., 2019; Mehta et al., 2019; Panchal, Jeevanandan and Subramanian, 2019; Rajendran et al., 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Sharma et al., 2019; Varghese, Ramesh and Veeraiyan, 2019; Gomathi et al., 2020; Samuel, Acharya and Rao, 2020).

MATERIALS AND METHODS
This is a retrospective study which was performed under a university setting in the year 2020. The data of patients who underwent amalgam restoration in the second maxillary premolars from June 2019 to March 2020 was collected by reviewing patients records and analysing data of 86000 patients. The ethical approval of the current study was obtained from the institutional ethical board (Ethical approval number : SDC/SIHEC/2020/DIASDATA/0619-0320). The collected data was cross verified with photographs and were compiled for statistical analysis on SPSS software. All patients applicable for the study (sample size)=25. Data of all patients who underwent class 1 amalgam restoration in maxillary 2nd premolar was included in the study. All Incomplete and censored data were excluded. Data entry was done in SPSS software for statistical analysis,

RESULTS AND DISCUSSION
From our study, it is evident that class 1 amalgam restoration in maxillary first premolar (tooth number : 15 and 25) were more commonly found in people of 34 years of age (3 cases -12%). There were 2 cases of people aged 36 years and 41 years of each (Graph 1). 16 patients were females (64%) and 9 patients were males (36%) showing a female predilection (Graph 2). Graph 3 shows that males of 41 years of age and females of 34 years of age were commonly found to have class 1 amalgam restoration in maxillary second premolars. The chi square test values were found to have no statistical significance for age and gender (Table 1).

Both composite resin and amalgam are considered as suitable materials for direct posterior filling. Currently, the use of amalgam is declining, and composite resin is used more often. However, prospective clinical studies have shown comparable annual failure rates of both the materials (Manhart et al., 2004). A retrospective study comparing the posterior composite and amalgam restorations placed in a general dental practice found no differences in longevity, but observed relatively more secondary caries in relation to composite and more fracture failures related to amalgam restorations (Opdam et al., 2007).

In the current study, class 1 amalgam restoration in maxillary 2nd premolar was found to be more common in age of 34 years (12%) (Graph 1). Lubisich E.B revealed that amalgam restoration is more common in older patients. He reported that patients of age 65 years were found to have amalgam restoration 1.5 times more when compared to patients of 18-64 years of age showing contradictory results (Lubisich et al., 2011). The chi square test was done and was statistically not significant (p>0.05).

Graph 2 shows a female predilection (64%) , indicating that class 1 amalgam restoration in the second maxillary premolar was more common in female patients than males. This is similar to the results obtained by Monacada G in his study (Moncada et al., 2015). His results show 58% of females and 42% of males. Lubisich E.B reported that there is no significant difference in amalgam restoration between the two genders. The chi square test was done and was statistically not significant (p>0.05).

Current study shows that males of 42 years of age and females of 30 years of age were found to have class 1 amalgam restoration in maxillary second premolars (Lubisich et al., 2011). According to Lubisich E.B amalgam restorations were found to be 2.5 times more in molars when compared to the bicuspids (Lubisich...
et al., 2011). Chi square test was done and Pearson chi square value was found to p=0.462; hence statistically not significant (p>0.05).

Overall, the study shows that class 1 amalgam restorations in the second maxillary premolar were more common among the patients of 34 years of age and more prevalent among the female population. The study was limited to a particular geographical area and a small sample size. Studying a greater population with patients from different geographical areas and ethnicities will yield a better result regarding the association of age and gender with the prevalence of class 1 amalgam restorations. Our institution is passionate about high quality evidence-based research and has excelled in various fields ((Pc, Marinuthu and Devadoss, 2018; Ramesh et al., 2018; Ezhilarasan, Apoorna and Ashok Vardhan, 2019; Ramadurai et al., 2019; Sridharan et al., 2019; Vijayashree Priyadharsini, 2019; Mathew et al., 2020)

CONCLUSION
Within the limits of the study, it is evident that class 1 amalgam restorations in the maxillary second premolars were more common among the patients of 34 years of age and prevalent among the females. The study also showed that males of 41 years of age and females of 34 years of age were commonly found to have class 1 amalgam restoration in maxillary second premolars. ACKNOWLEDGEMENT
The authors would like to acknowledge the help and support rendered by the Department of Conservative Dentistry and Endodontics and Department of Information Technology of Saveetha Dental College and Hospitals, SIMATS for their constant assistance for this research. AUTHOR CONTRIBUTION
Author 1 (Shamaa anjum.A) carried out the retrospective study by collecting data and drafted the manuscript after performing the necessary statistical analysis. Author 2 (Dr. Delphine Priscilla Antony. S) aided her conception of the topic, participated in the study design, statistical analysis and supervised in preparation of manuscript. All authors have equally contributed in developing the manuscript. CONFLICT OF INTEREST
Nil REFERENCES
12. Ezhilarasan, D., Sokal, E. and Najimi, M. (2018) ‘Hepatic fibrosis: It is time to go with hepatic stellate cell-
A. Shamaa Anjum et al/ Association Of Age And Gender Of Patients Who Underwent Amalgam Restoration In Maxillary Second Premolar With Class I Dental Caries


**LIST OF TABLES AND GRAPHS:**
Figure 1: Prevalence of class 1 amalgam restoration among different age groups
Figure 2: Prevalence of class 1 amalgam restoration between different gender
Figure 3: Association of age and gender of patients

**Table 1: Descriptive analysis of the age and gender of the patient and tooth number.**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
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<td>.490</td>
</tr>
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<td>25</td>
<td>25.00</td>
<td>.000</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: shows the descriptive analysis of age of the patient, gender of the patient and tooth number in which the class 1 amalgam restoration is done. From the table it is evident that mean age was found to be 33.88 ± 8.482 and mean gender was found to be 0.64 ± 0.49.
Fig. 1: The bar graph depicts the prevalence of class 1 amalgam restorations in the second maxillary premolar among different age groups where, the frequency of patients with class 1 amalgam restoration in maxillary second premolar is plotted on scale of 0 to 6 along the Y axis. The age of patients who underwent class 1 amalgam restoration in the maxillary second premolar is plotted on a scale of 10 to 70 along the X axis. It is evident that class 1 amalgam restoration in maxillary first premolar were more commonly found in people of 34 years of age. Chi square test; p=0.100; statistically not significant (p>0.05).

Fig. 2: The bar graph depicts the prevalence of class 1 amalgam restoration between different genders. Blue represents males and red represents females. It is evident that class 1 amalgam restoration in maxillary first premolar were more common among females. Chi square test; p=0.162; statistically not significant (p>0.05).
Fig. 3: The bar graph depicts the association of age and gender of patients who underwent class 1 amalgam restorations in maxillary second premolar. Blue represents males and red represents females. The age of the patient is plotted along the X axis. The number of patients is plotted along the Y axis. It is evident that males of 41 years of age and females of 34 years of age were commonly found to have class 1 amalgam restoration in maxillary second premolars. Chi square test; Pearson chi square value $p=0.462$; statistically not significant ($p>0.05$).