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Association of non-vital teeth and the type of treatment followed by dental trauma in 6-12 years children

Akash.N
Research Associate
Dental Research Cell
Saveetha Dental College and Hospitals,
Saveetha Institute of Medical and Technical Sciences,
Saveetha University,
Chennai, India

Bhagya Lakshmi T
Senior lecturer,
Department of Pedodontics and Preventive dentistry,
Saveetha Dental College and Hospitals,
Saveetha Institute of Medical and Technical Sciences,
Saveetha University,
Chennai, India

Corresponding Author*
Bhagya Lakshmi T*
Senior lecturer,
Department of Pedodontics and Preventive dentistry,
Saveetha Dental College and Hospitals,
Saveetha Institute of Medical and Technical Sciences,
Saveetha University,
162, Poonamallee High Road, Chennai - 600077
Tamil Nadu, India

ABSTRACT:

The aim of the study is to assess the association of non-vital teeth and the type of treatment followed by dental trauma. A tooth is referred to as being 'dead' when there is no longer any blood flow to it. Sometimes this is also known as a 'non-vital tooth. ' Both tooth decay and an injury can cause a dead tooth. Apexification is a method of treating and preserving immature permanent teeth which lost their vitality, this is by the development of the root apex of an immature pulpless tooth by formation of osteo cementum. Revascularization is a treatment which is done by piercing through the apex and formation of blood clot. The study was carried out among 6-12 years old children who underwent treatment in Saveetha Dental College. The data was obtained from DIAS, then filtered for non vital teeth history and the final data is recorded in excel sheet. Descriptive analysis and chi square test are done in SPSS in relation to Non vital teeth to treatment (apexification and revascularization).Studies reveal that apexification is the source treatment, revascularization is a modification of it. Revascularization is a treatment which brings back non vital teeth to vital by blood clot. This process is termed as rejuvenation of the tooth. The process of pulp regeneration by revascularization is called maturogenesis.Hence we can conclude that revascularization is common among 6-8 yrs old patients whereas apexification is common among 10-12 years old patients.

Keywords: apexification, maturogenesis, non vital teeth, rejuvenation, revascularisation.

INTRODUCTION:

The purpose of this retrospective study is to assess the association of mineral trioxide aggregate apexification and revascularization in relation to children of 6-12 years subjected to dental trauma(Andreasen *et al.*, 2012). The development of immature teeth can be arrested because of various harmful stimuli such as trauma, caries and anatomic variations such as dens evaginatus. A tooth is referred to as being 'dead' when there is no longer any blood flow to it(Tsurumachi, 2013; 'Dental Trauma and Treatment Needs among Footballers in Baghdad City', 2017). Sometimes this is also known as a 'non-vital tooth'. Both tooth decay and an injury can cause a dead tooth. Hence the relation of the dental trauma over the teeth are analysed(Gábris, Tarján and Rózsa, 2001). As a result of trauma, there is huge possibility of pulp necrosis, non vital teeth may persist or may be subjected to mobility followed by avulsion(Cms, 2015). But in case of immature teeth, they remain with fragile dentinal walls which are susceptible to cause oral ulcers and necrosis(Ivanytska, 2020). They can also lead to generalised oral ulcers, causes mobility of the whole dental arch. Apexification and revascularization have been considered effective treatment procedures for immature non vital teeth(Tsai, 2001). Apexification is a method of treating and preserving immature permanent teeth which lost their vitality, this is by the development of the root apex of an immature pulpless tooth by formation of osteo cementum(Brüllmann, Schulze and d'Hoedt, 2011). Revascularization is a treatment which is done by piercing through the apex and formation of blood clot.

Several studies have compared the effectiveness between the apexification and revascularization in terms of success and further tooth development(Leroy *et al.*, 2000). The evaluation of these apexification and revascularized treated teeth was based on the clinical and radiographic examination(Arhakis *et al.*, 2010). Apexification involves disinfecting the root canal, promoting an apical hard tissue barrier and obturating the empty canal space with the root canal filling material(Bakland, 1999). On the other hand revascularization aims to replace the lost tissue and promotes continued root development(Tronstad, 1995). They can function with stem-cell mediated growth of reparative tissue(Andreasen, Lauridsen and Andreasen, 2010). Trauma diagnosis is sometimes difficult because the minor trauma is difficult to differentiate from caries(Andreasen, Lauridsen and Andreasen, 2010).

This research is needed to obtain information about the type of treatment susceptible for specific age groups of children. It can be used to analyse the speciality of that specific process and advance in various measures. The aim of the study is to assess the association of non-vital teeth and the type of treatment followed by dental trauma.

MATERIALS AND METHODS:

The present study was carried out among 6-12 years children who underwent treatment in Saveetha Dental College. The collection of data of Saveetha dental college and hospitals called DIAS has been taken for the research study. The DIAS stands for Dental Information Archiving System, and has a collection of data of all the patients who have undergone diagnosis or treatment in Saveetha Dental College and Hospitals. They have a completed case history of about 39.9 million. The data was collected from DIAS, then filtered for non vital teeth history and the final data is recorded in excel sheet. Descriptive analysis and chi square test are done in SPSS version 23 in relation to Non vital teeth to treatment (apexification and revascularization). The graphs are plotted by using SPSS software. Independent variables are name and educational qualification. Dependent variables include age, gender and type of dental injuries.

RESULTS AND DISCUSSION:

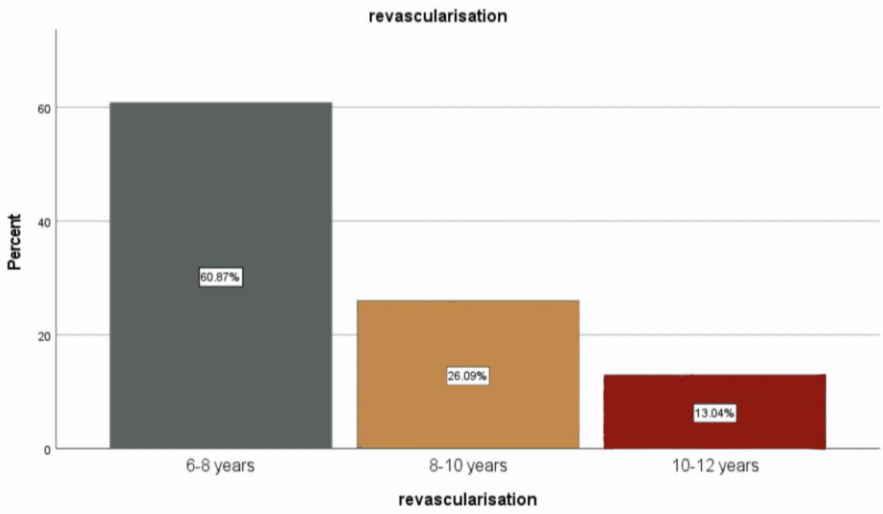

Fig.1: This bar graph represents the revascularisation treatment done to the different age grouped patient. X axis represents the age of the patients and Y axis represents the percentage of prevalence. Responses whereas follows -- grey represents 6 to 8 years is- 60.87%, orange represents 8 to 10 years is 26.09% and maroon represents 10 to 12 years is 13.04%.

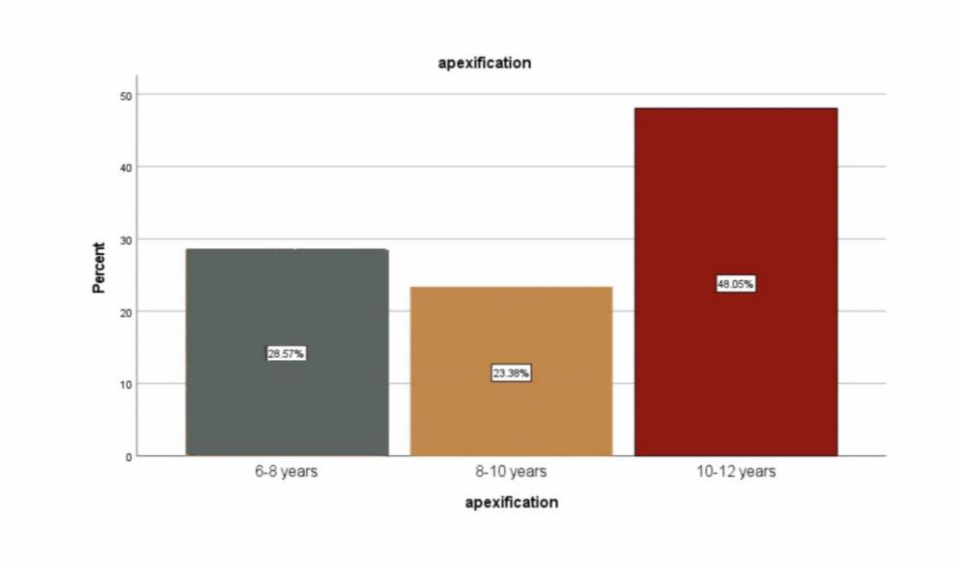

Fig.2: This bar graph represents the apexification treatment done to the different age grouped patient. X axis represents the age of the patients and Y axis represents the percentage of prevalence. Responses whereas follows -- grey represents 6 to 8 years is 28.57%, orange represented 8 to 10 years is 23.38% and maroon represents 10 to 12 years is 48.05%.

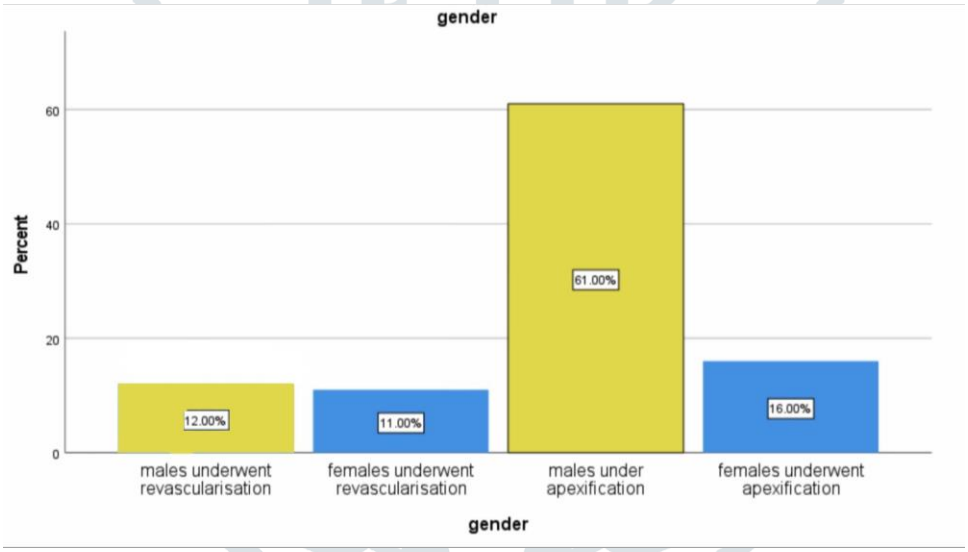

Fig.3: This bar graph represents the association of the gender and treatment with the type of treatment patients underwent. X axis represents the gender of the patients and Y axis represents the percentage of prevalence. In the graph, yellow represents male, blue represents female. Responses whereas follows -- males underwent revascularisation- 12%, females underwent revascularization- 11%, males underwent apexification- 61%, and females underwent apexification- 16%. Apexification in males was the most common type of treatment done to children. However, revascularisation was more commonly seen in males. The difference was statistically significant Chi square test; DF: 1, p value-0.000(>0.05) hence statistically significant.

A cross sectional study between the age groups 6 to 12 years, they were selected from the set of data called DIAS (denta information archiving software) of Saveetha Dental College(Mahendran *et al.*, 2017).A total of 119435 dental trauma in children has been reported, Case sheets of all the patients are analysed. Internal validity includes study design, methodology, analysis, standardisation and the external validity includes sampling of the study. The tabulation of the DIAS data was tabulated in Excel sheet and then transferred to SPSS. From fig.1 we can see that the revascularization is done mostly on the age group of 6 to 8 years. Out of 119435, revascularization of teeth is done in 24234 cases(60.87%). The treatment is done by cleaning the root canal and clearing the apex(Aggarwal *et al.*, 2013). Once the apex is cleared, they are poked in the blood vessel to fill blood in the teeth, this ll act as pulp(Lolayekar, Bhat and Hegde, 2009). Once one third of the tooth is filled with blood, they are then filled with MTA(mineral trioxide aggregate)(Fayazi, Bayat-Movahed and White, 2013). This case, the vascularity is brought back, hence called the rejuvenation of the teeth. This can be done only in the primary teeth. As fig.2 represents the apexification is mostly done on 10 to 12 years of age group patients. Out of 119435, revascularization of teeth is done in 19134 cases(48.05%). Apexification is a process of clearing the root canal and dealing the apex with mineral trioxide aggregate, followed by filling the root canal with MTA with a post and core(Yazdizadeh *et al.*, 2013; Kumar *et al.*, 2014; Singh, 2019). As fig.3 represents the gender comparison of dental treatment done for the patients. As the graph shows, the most number of treatment done in this collection of cases is , apexification treatment done for male patients, which is about 61%. Studies reveal that apexification is the source treatment and revascularisation is the the modification of it(Bai *et al.*, 2021). Revascularisation is the treatment which brings back non vital teeth to vital

by a blood clot, this is termed as rejuvenation(Chiang *et al.*, 2021). The process of pulp regeneration is known as maturogenesis(Anthrayose *et al.*, 2021).

CONCLUSION:

By the above study we can conclude that revascularisation is common among 6 to 8 years old patients whereas apexification is common among 10 to 12 years old patients. And most frequent treatment encountered in children with dental trauma is apexification.

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