

ETIOLOGY AND MANAGEMENT OF ENDODONTIC FLARE UPS -A SURVEY AMONG DENTAL STUDENTS

¹Jaya vabushana V, ²Dr.Hima Sadeep*

¹Saveetha dental college and Hospital, Saveetha Institute of Medical and Technical Sciences, Chennai - 600077, Tamilnadu, India

²*Senior Lecturer, Department of Conservative Dentistry and Endodontics, Saveetha Dental College and Hospital, Saveetha Institute of Medical and technical sciences (SIMATS), Saveetha University, Chennai-77, Tamilnadu, India.

Abstract

INTRODUCTION: A flare-up is defined as the occurrence of severe pain and swelling following an endodontic treatment appointment, requiring an unscheduled visit and active treatment. ('Endodontic flare-ups with periapical lesions', 2009) Flare-up is a well known complication that disturbs both patients and dentists. An endodontic flare-up is an acute exacerbation of an asymptomatic pulp or periapical pathosis after the initiation or continuation of root canal treatment. (Kaur, 2015) The reported incidence of interappointment flare-ups ranges from 1.4 to 19%. Interappointment flare-ups form a true emergency that requires an unscheduled patient visit and immediate active treatment for pain relief. The aim of this survey was to assess the awareness, knowledge and practice of the endodontic flare ups and its treatment.

MATERIALS AND METHOD: An online survey was conducted among 157 undergraduates to evaluate their knowledge in etiology and management of endodontic flare ups among dental students. A convenience sample was taken and the questionnaire was distributed on an online platform. This online questionnaire survey consisted of 14 questions that were distributed to the study population through google forms. The data which was collected was analyzed using Statistical Package for Social sciences (SPSS) software, version 1.0.0.1347 64 bit (IBM Corp., NY, USA).

RESULTS: The data were assessed by being subjected to descriptive analysis with the help of frequencies, percentages, means. The data was represented by the means of bar graphs. A Chi-square test was used and results were correlated and associated. Pearson chi square test; value - 146.248, df -12, p value- 0.03 (>0.05). Hence it is proven that the graph is statistically significant.

CONCLUSION: This study shows that the dental students are not aware of the etiology and management of the endodontic flare ups. This study helps students to get knowledge about the etiology and management of the dental flare ups and how to handle the situation and how to treat the flare ups.

KEY WORDS: flare ups, pain, swelling, root canal treatment.

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INTRODUCTION:

A flare-up is defined as the occurrence of severe pain and swelling following an endodontic treatment appointment, requiring an unscheduled visit and active treatment. ('Endodontic flare-ups with periapical lesions', 2009) Flare-up is a well known complication that disturbs both patients and dentists. An endodontic flare-up is an acute exacerbation of an asymptomatic pulp or periapical pathosis after the initiation or continuation of root canal treatment. (Kaur, 2015) The reported incidence of interappointment flare-ups ranges from 1.4 to 19%. Interappointment flare-ups form a true emergency that requires an unscheduled patient visit and immediate active treatment for pain relief. The predisposing factors that can contribute to an endodontic flare-up are Shaping errors, overinstrumentation: This iatrogenic error results in forcing debris into the periradicular region resulting in an acute inflammatory response.

Incomplete or under instrumentation : This may provide pulpal remnants for the persistence of microorganisms. This leads to the production of virulence factors that may cause a previously asymptomatic infection to become symptomatic resulting in a flare-up.

shaping technique: Improper shaping protocol that might cause extrusion of debris is a significant cause of an endodontic flare-up. (Katta, Bapuji Dental College & Hospital and (Karnataka), 2015; Kaur, 2015)

Due to Cleaning errors are irrigant extrusion: The standard regimen of irrigation used routinely is 0.1–5.2% NaOCl with 17% EDTA. In endodontics, every procedure including irrigation of pulp space is passive in nature. Inadvertent extrusion of irrigant beyond the periapex, termed sodium hypochlorite accident, may be one of the causes of endodontic flare-ups.(Rosenberg, 2014) Signs of hypochlorite accident: the patient complains of severe and excruciating pain especially when he/she is not under local anesthesia. even if the patient is under local anesthesia, he/she will complain of irritation at the periradicular area. there is a sudden flooding of the canal with blood and tissue fluids. there may be ballooning of the tissues in the area and swelling of soft tissues.(Mittal, 2010)

As sodium hypochlorite is hypertonic, if it enters the periradicular tissues, it would open up the capillaries and minute blood vessels. Flooding of the canal with blood is a physiological reaction to dilute the concentration of sodium hypochlorite. (Siqueira, 2003)The patient has to be informed about the accident. If the patient is not under local anesthetic, block anesthesia should be given. Bleeding from the canal is continuously allowed to flow since this is a defense physiological mechanism. The canal is flooded with normal saline so that the accumulated blood comes out and the level of pain decreases.(Aksoy, Pehlivan and Buhara, 2020)

Sodium hypochlorite can dissolve both normal and infected tissue. Post sodium hypochlorite accident, the periradicular area remains inflamed and the tissues are necrosed. It is preferred that the patient is immediately placed on parenteral antibiotic therapy and analgesics(Azim, Azim and Abbott, 2017). Call the patient for a follow-up periodically to assess the rate of healing. In the event of an uncontrolled flare-up, some endodontists would prefer to consult a general surgeon or a physician and administer steroids in a planned manner. The patient may require backup vitamin therapy during the recovery phase.(Aksoy, Pehlivan and Buhara, 2020; Shamszadeh *et al.*, 2021)(Muthukrishnan, 2021a)(Acharya, 2020)(Website, no date a; Muthukrishnan, 2021b)(Website, no date a)(Website, no date a, Website, no date b)(Dental Caries Profile and Associated Risk Factors Among Adolescent School Children in an Urban South-Indian City, no date)([No title], no date, Website, no date c)(Website, no date d)

Management of Endodontic Flare-Ups is done by Anxiety reduction, Behavioral intervention, Occlusal reduction, Pharmacologic measures, Antibiotics,NSAIDs and acetaminophen, Long-acting local anesthesia. Mechanism of Endodontic inflammation is After Microbial infection and periapical inflammation, local adaptation response or asymptomatic phase where disease persists without progressing takes place.(Aminoshariae *et al.*, 2016) Now rct is initiated. Tyn introduction of irrigants takes place in which microbial byproducts, irrigants, medicaments, altered tissue proteins are degraded. Severe inflammatory response will be present and ends up in Endodontic flare up. Or flare up may happen due to progression of diseases.No challenges are faced in previous research. The research is needed to know the awareness of dentals on etiology and management of endodontic flare ups. The research also fulfills the deficiency of work on describing the types of flare ups. Our team has extensive knowledge and research experience that has translate into high quality publications(Sathivel *et al.*, 2008; Panda *et al.*, 2014; Govindaraju, Neelakantan and Gutmann, 2017; Johnson *et al.*, 2020; Saraswathi *et al.*, 2020) (Kumar *et al.*, 2006; Devi and Gnanavel, 2014; Varghese *et al.*, 2015; Sivamurthy and Sundari, 2016; Chen *et al.*, 2019).The aim of the research was to educate and make dental students aware of the management of flare ups and its treatment.

MATERIALS AND METHOD

An online survey was conducted among 157 undergraduates to evaluate their knowledge in etiology and management of endodontic flare ups among dental students. A convenience sample was taken and the questionnaire was distributed on an online platform. This online questionnaire survey consisted of 14 questions that were distributed to the study population through google forms. The study includes Under graduate students (1st year, 2nd year, 3rd year, 4th year, interns). This study excludes Post graduates and practitioners.

The questionnaire validity checking was done in a standard manner. Descriptive statistics were done, percentages and frequencies were calculated and to test the difference among variables chi-square test was done with a p-value <.05 considered statistically significant.

Data Analytics Data was entered into a spreadsheet using Excel version 16.37 (Microsoft Corp, Redmond, Wash). The data which was collected was analyzed using Statistical Package for Social sciences (SPSS) software, version 1.0.0.1347 64 bit (IBM Corp., NY, USA). The data were assessed by being subjected to descriptive analysis with the help of frequencies, percentages, means. The data was represented by the means of bar graphs. A Chi-square test was used and results were correlated and associated.

RESULTS:

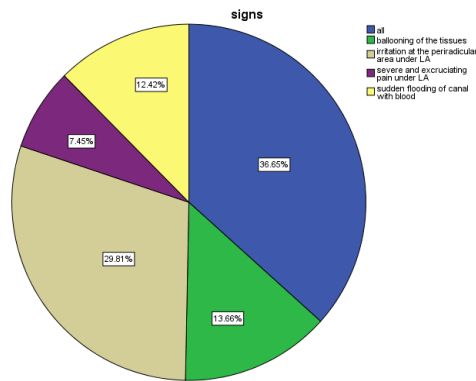


Figure 1: This pie chart indicates responses for question about the signs of the dental flare ups. 12.42% responses responded sudden flooding of canal with blood, 7.45% of the responders replied to severe and excruciating pain under local anesthesia, 29.8% of the responders replied irritation under Local anesthesia, 13.6% responders replied ballooning of the tissues, remaining 36.5% of the responders replied all the above.

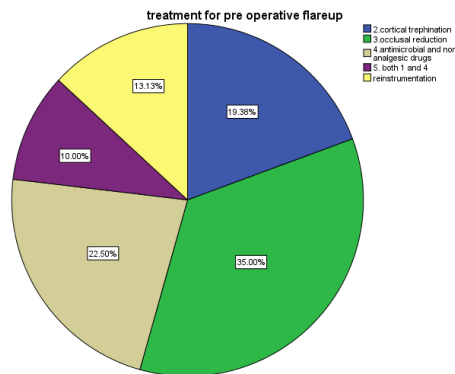


Figure 2: this pie chart indicates the treatment of pre operative flare ups. 13.1% responders responded reinstrumentation, 19.4% responders responded cortical trephination, 35% of responders responded occlusal reduction, 22.5% of responders responded antimicrobial and non analgesic drugs, 10% responders responded both reinstrumentation and antimicrobial non analgesic drugs

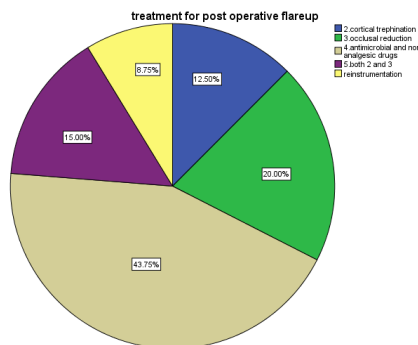


Figure 3: This pie chart indicates responses for question about the treatment of post operative dental flare ups. 43.5% responders responded antimicrobial and non analgesic drugs, 12.5% responders responded cortical trephination, 20% responders responded occlusal reduction, 8.75% responders responded reinstrumentation, 15% responders responded both cortical trephination and occlusal reduction.

Figure 4: The association graph represents the management of the endodontic flare ups. The options are antibiotics, nsaid, occlusal reduction, and all of the above. The x axis represents the year of study and y axis represents the responses of the students. Blue represents all of the above, green represents antibiotics, yellow represents nsaid, purple represents occlusal reduction. Pearson chi square test; value - 146.248, df -12, p value- 0.03 (>0.05). Hence it is proven that the graph is statistically significant. This proves that there is a different amount of awareness among different year students

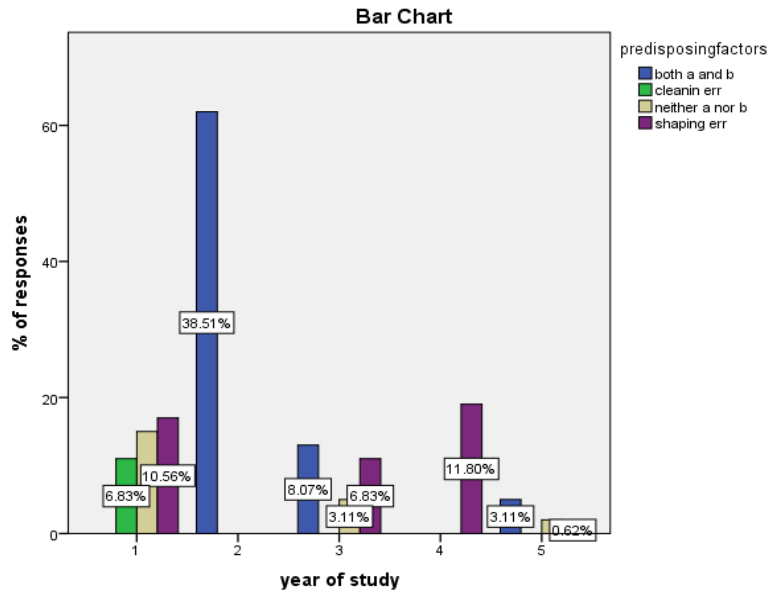


Figure 5 : this association graph represents the predisposing factors of the endodontic flare ups. The options are cleaning error, shaping error, both a and b and neither a nor b. The x axis represents the year of study and y axis represents the no. of responses. Blue represents both a and b, green represents cleaning error, yellow represents neither a nor b, purple represents shaping error, Pearson chi square test; value - 171.925, df -12, p value- 0.018(<0.05). Hence it is proven that the graph is statistically significant. This proves that there is a significant amount of difference in the awareness among different year of study

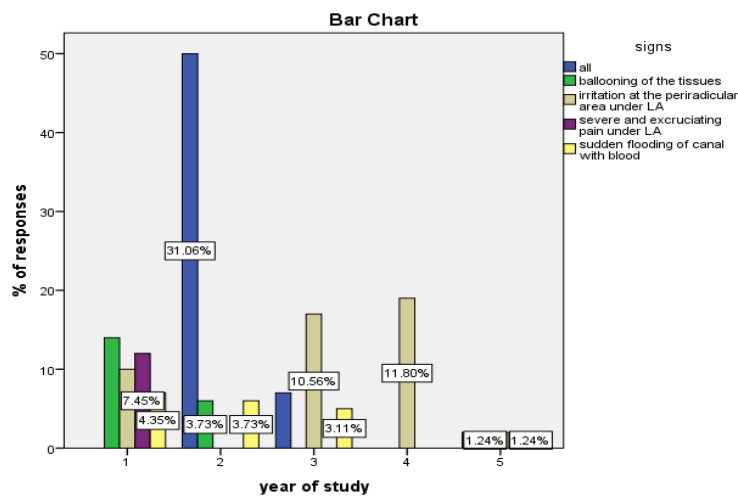


Figure 6: this bar chart represents the signs of the endodontic flare ups. The options are ballooning of the tissues, irritation of the periradicular tissue under local anesthesia, severe and excruciating pain under the local anesthesia, sudden flooding of blood and all the above. The x axis represents the year of study and y axis represents the no. of responses. Blue represents all the above, green represents ballooning of the tissues, yellow represents sudden flooding of blood, beige represents the irritation at the periradicular tissue under local anesthesia, purple represents severe and excruciating pain under local anesthesia. Pearson chi square test; value -172.649, df- 12, p value- 0.025(<0.05). Hence it is proven that the graph is statistically significant. This proves that there is a significant amount of difference in the awareness among different years.

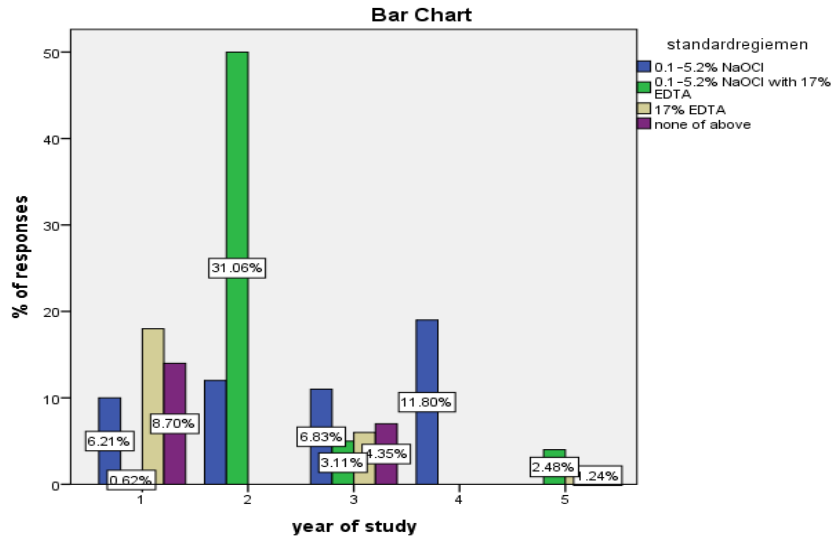


Figure 7: this bar chart represents the standard regimen of the endodontic flare ups. The options are 0.1 - 5.2 Naocl% , 0.1-5.2% Naocl with 17% EDTA, 17% EDTA, and none of the above. The x axis represents the year of study and y axis represents the no. of. responses. Blue represents 0.1 - 5.2 Naocl%, green represents 0.1 - 5.2 Naocl% with 17% of EDTA, yellow represents 17% of EDTA, purple represents none of the above. Pearson chi square test; value - 145.754, df -12, p value- 0.038(<0.05). Hence it is proven that the graph is statistically significant. This proves that there is a significant amount of difference in the awareness among different year of study.

DISCUSSION:

In this study, from the responses that we have collected it is very clear that the dental students are not aware of the endodontic flare ups, How to treat it, what are all the signs and symptoms, pre and post operative flare ups. Nearly 50% of male students and 50% of female students are involved in this study. For the question asked about what is endodontic flare only 45% of the responders responded the correct answer. For the question about management of the flare up only 41% gave the correct answer. For the question about predisposing factor 49% replied correct answer. For question about signs only 36. 7% replies correct answer. For a question about symptoms only 20% replied correct answer, for a question about drugs used for treatment only 41% replied correct answer, for a question about techniques used for curing it only 25% replied correct answer. For all the questions which were asked the students only below 50% of the people replied with the correct answers. Thus, from this it is very clear that students are not aware of the endodontic flare ups. In immature teeth with open apices, care should be exercised to ensure that the irrigant is not extruded into the periradicular space inadvertently.

to avoid flushing of the canal before constriction, keep the needle passively fitting in the canal and do not wedge it against the root canal wall. There are several irrigating needles available with lateral (side vented) opening with the api- cal end closed. The use of such needles may be a safe way to irrigate the apical one-third area.(Al-Razhi, Fadag and Alqutaibi, 2018)(Website, no date e; Vijayashree Priyadharsini, 2019)(Uma Maheswari, Nivedhitha and Ramani, 2020)(Gudipani et al., 2020; Uma Maheswari, Nivedhitha and Ramani, 2020)(Chaturvedula et al., 2021)

Certain clinical situations require special irriga- tion precautions including open apices, partic- ularly in young patients. Adopting a modified technique of using sodium hypochlorite more as a working solution will solve the problem. Sodium hypochlorite has to be passively placed into the pulp chamber during instrumentation rather than being employed as an active irrigant.

normal saline should be used to flush out the sodium hypochlorite.(Nair *et al.*, 2017)(Kanniah *et al.*, 2020)(Kanniah *et al.*, 2020; Palithya *et al.*, 2022)

pulpo periapical status: Studies have indicated that teeth with vital pulps result in fewer flare-ups compared with those with necrotic pulps. Similarly, teeth with acute alveolar abscesses have a higher incidence of flare-ups.(Priyank *et al.*, 2016) Retreatment cases: These cases have a significantly higher incidence of flare-ups compared to primary endodontic cases as there is a greater tendency to push the necrotic debris apically during treatment. Another postulated cause is that the microbiota associated with such cases are usually therapy resistant.(Nair *et al.*, 2017; Western and Dicksit, 2017)

Anxiety If a patient expects pain to occur during endodontic treatment, there is an increased likelihood that an increased amount of pain will be perceived following completion of subsequent treatment. Preoperative History of Pain There is a highly significant correlation between preoperative pain and/ or swelling and the incidence of interappointment flare-ups.(Gambarini *et al.*, 2017; Nair *et al.*, 2017; Western and Dicksit, 2017)

LIMITATIONS: There is no equal sample size distribution among the dental students. Thus it leads to variation in results.

FUTURE SCOPE: Further study can be done with more questions and in more population. Post graduates and practicing doctors can also be included in further study.

CONCLUSION:

This study shows that the dental students are not aware of the etiology and management of the endodontic flare ups. This study helps students to get knowledge about the etiology and management of the dental flare ups and how to handle the situation and how to treat the flare ups. Furthermore researches can be done to improve the knowledge of dental students about the dental flare ups and the treatment of flare ups.

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CONFLICT OF INTEREST: Nil

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