

Prevalence of pain following single-visit pulpectomy with stainless steel crown done by postgraduate students in a university sitting

Ashwin Shravan Kumar,
Mahesh Ramakrishnan

Department of Paediatric and Preventive Dentistry, Saveetha Institute of Medical and Technical Sciences, Saveetha Dental College and Hospitals, Saveetha University, Chennai, Tamil Nadu, India

J. Adv. Pharm. Technol. Res.

ABSTRACT

Pain is usually a very unpleasant experience, it can be felt by any age group whose sensory and cognitive components have been developed. Children tend to experience pain in around 65% of dental procedures. It can affect daily activities, and in many situations, it can lead to crisis. Since it is a developing child, the concept of pain can influence adversely in the mind of the child. The clinical records of all pulpectomy cases during the period between January 1, 2020, and January 1, 2021, were analyzed. Gender and age of the patients were also included in the study. The majority of children in our study group were males; children who had a proper abscess of any kind of symptoms tend to have a higher incidence of postoperative pain compared to children with the least symptoms. The study identified that children experienced less pain following multi-visit pulpectomy when compared with single visits during the 1st 3 days. In children who were treated with both single-visit pulpectomy and stainless steel crown experienced no difference in pain perception in the first 3 days of appointment.

Key words: Age, innovative, pulpectomy, single, innovative technique, novel method

INTRODUCTION

Experience of pain is one of the significant unpleasant experiences for all age groups.^[1] In dental procedures, it is estimated that 65% experience some degree of pain after the dental procedures.^[2,3] In some situations, the degree of pain can affect the quality of life in an individual. In children, it is of utmost importance since it can affect the

long-term psychological effect. Children who experience any degree of pain tend to delay the dental treatment and therefore complicate further management and severity of the disease.^[4-6]

Pain during dental treatments in children can lead to the discontinuation of care by the parent. Young children often lack the cognitive skills to pain management strategies. Pain is considered to be a subjective phenomenon in many situations it varies from one person to another. In children, there is a difficulty in evaluation pain due to various degrees of cognitive development, understanding the questions, response to pain, fear, and anxiety. Individual degree of pain is the standard method to evaluate the pain during any procedure.^[7,8]

Address for correspondence:

Dr. Mahesh Ramakrishnan,
Department of Paediatric and Preventive Dentistry, Saveetha Institute of Medical and Technical Sciences, Saveetha Dental College and Hospitals, Saveetha University, Chennai, Tamil Nadu, India.
E-mail: maheshpedo@gmail.com

Submitted: 22-May-2022

Revised: 11-Jul-2022

Accepted: 17-Jul-2022

Published: 30-Nov-2022

Access this article online

Quick Response Code:



Website:

www.japtr.org

DOI:

10.4103/japtr.japtr_408_22

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Kumar AS, Ramakrishnan M. Prevalence of pain following single-visit pulpectomy with stainless steel crown done by postgraduate students in a university sitting. *J Adv Pharm Technol Res* 2022;13:S177-80.

Preservation of pulpal involved primary teeth to maintain the arch circumference is an ideal space maintainer.^[9-11] When the coronal and radicular pulp is involved, then it is indicated for pulpectomy procedures.^[12-14] Moreover, in nonvital teeth to maintain it until the exfoliation stage can be done only with pulpectomy procedure where the infected radicular pulp is removed followed by biomechanical preparation and the canal is obturated with resorbable material. There is much available literature to prove the higher success rates in pulpectomy procedures.^[15,16] Another limitation of this procedure is that it can, in some situations, cause severe amounts of pain and leads to dissatisfaction among the patients. The number of the visit also influences the patient's acceptance of the treatment. There is no clear picture of whether the results will vary based on the number of visits, it has not been evaluated in the literature.^[17,18]

The research team in our university have translate many ground-breaking studies which are published in high-ended journals.^[19-38] Therefore, the aim of this study was to compare the level of posttreatment pain between male and female patients following single-visit pulpectomy.

METHODOLOGY

The methodology was done as a retrospective, single-centered study. Approval for the project was obtained from the Saveetha Dental College Institutional Ethical Committee (Ethical clearance approval number. SDC/SIHEC/2020/DIASDATA/0619-0320). We reviewed case sheets of the data of children who had undergone single-visit pulpectomy. Incomplete data were excluded from the study. Age and gender were collected. These data were cross-verified with photographs and radiographs.

Descriptive statistics (percentage, mean, and standard deviation) and inferential tests (Chi-square test) were done appropriately.

RESULTS AND DISCUSSION

Figure 1 represents the association between age and postoperative pain following single-visit pulpectomy with stainless steel crown. X-axis represents age (<3, 4-8, and 8-13). Y-axis represents the presence of pain (orange-no and violet-yes).

Figure 2 represents the association between teeth and postoperative pain following a single-visit pulpectomy with stainless steel crown. X-axis represents age (mandible and maxilla). Y-axis represents the presence of pain (Orange-no and violet-yes). Chi-square analysis was performed, and *P* value was < 0.01.

Figure 3 represents the relationship between the genders and postoperative pain following a single-visit pulpectomy with stainless steel crown. X-axis represents gender (female and male). Y-axis represents the presence of pain (orange-no and violet-yes).

Previous studies conducted by Ashkenazi *et al.* indicated that more than 38% of patients in the group suffer from some form of posttreatment pain.^[39] Children tend to have some degree of pain following pulpectomy procedures, the degree varies with the amount of preoperative infection. Children with nonvital teeth with abscess showed more prevalence of pain following pulpectomy and stainless steel crowns compared to vital teeth pulpectomy.^[40,41] Degree of pain is more when it is a class 2 cavity involving pulp

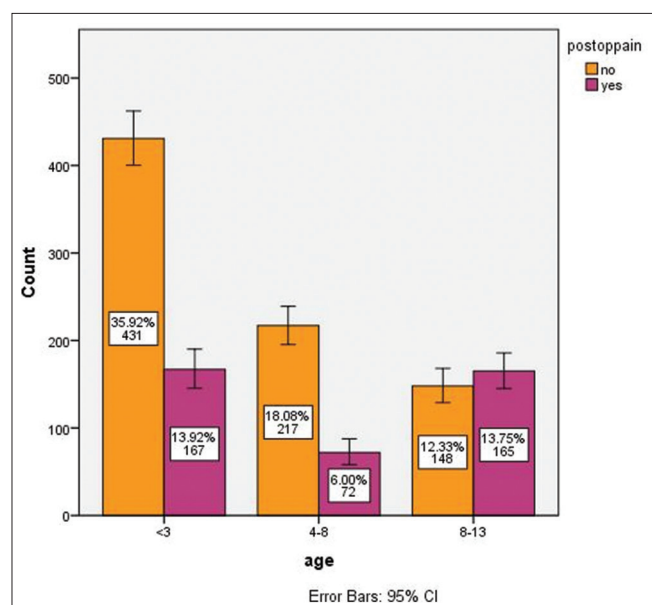


Figure 1: Relationship between the genders and postoperative

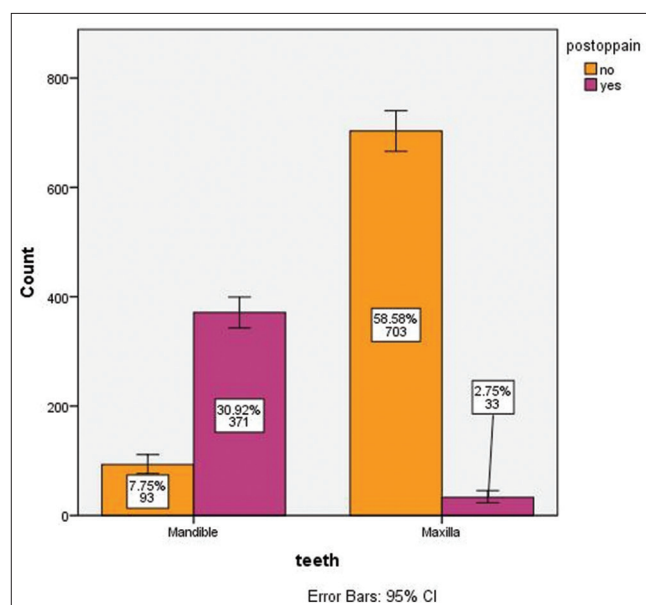


Figure 2: Association between teeth and postoperative pain

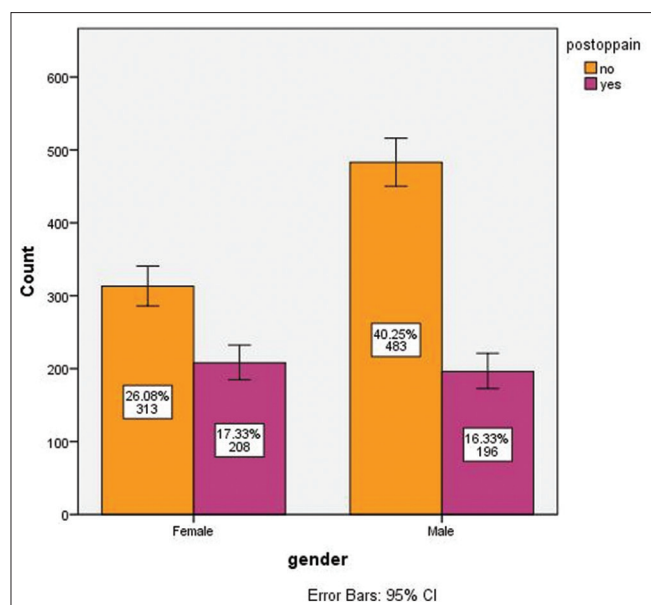


Figure 3: Relationship when compared with gender

compared to the class 1 cavity.^[42,43] Ashley *et al.* revealed that T type of treatment and postoperative pain correlates a significant relationship.^[44] The results from the previous literature indicate that the degree of pain is high in the 1st 6 h postoperatively

The condition of the tooth preoperatively is an indication for the extent of pain postoperatively. There are various research in the literature to prove the degree varies among different children. Spontaneous pain and intensity of pain preoperatively can influence the degree after the procedure is completed.^[45-47]

CONCLUSION

Children experienced a lower degree of pain in multi-visit pulpectomy procedures compared to single-visit procedures in the first 3 days of appointment. Placement of stainless steel crown does not imply a high degree of pain compared to without crown placement.

Acknowledgments

The authors would like to Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Science, Saveetha University.

Financial support and sponsorship

The present study was supported by the following agencies Saveetha Dental College, Saveetha Institute of Medical and Technical Science, Saveetha University Kumaran Furnitures Pvt. Limited.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Holdcroft A, Jaggar S. Core Topics in Pain. London: Cambridge University Press; 2005. Available from: https://books.google.com/books/about/Core_Topics_in_Pain.html?hl=&id=aJEmA8HmTCEC. [Last accessed on 2022 Apr 11].
- Torabinejad M. Mineral Trioxide Aggregate: Properties and Clinical Applications. London: John Wiley & Sons; 2014. Available from: <https://play.google.com/store/books/details?id=hRb1BgAAQBAJ>. [Last accessed on 2022 Apr 11].
- Torabinejad M, Walton RE. Endodontics: Principles and Practice. London: Elsevier Health Sciences; 2009. Available from: <https://books.google.com/books/about/Endodontics.html?hl=&id=bbuYu0IX-EwC>. [Last accessed on 2022 Apr 11].
- Camilleri J. Mineral Trioxide Aggregate in Dentistry: From Preparation to Application. London: Springer; 2014. Available from: <https://play.google.com/store/books/details?id=6cAqBAAAQBAJ>. [Last accessed on 2022 Apr 11].
- Cohenca N. Disinfection of Root Canal Systems: The Treatment of Apical Periodontitis. London: John Wiley & Sons; 2014. Available from: https://books.google.com/books/about/Disinfection_of_Root_Canal_Systems.html?hl=&id=Jr0BBAAAQBAJ.
- van Amerongen E. Case Reports in Pediatric Dentistry. London: Quintessence Publishing Company; 2009. Available from: https://books.google.com/books/about/Case_Reports_in_Pediatric_Dentistry.?hl=&id=Mpc6PgAACAAJ. [Last accessed on 2022 Apr 11].
- Kamatham R, Saikiran K, Sahiti P, Nuvvula S. Pulpotomy medicaments in primary teeth: A literature review of natural alternatives. SRM J Res Dent Sci 2018;9:181.
- Hunter ML, Hunter B. Vital pulpotomy in the primary dentition: Attitudes and practices of specialists in paediatric dentistry practising in the United Kingdom. Br Dent J 2003;195:327.
- Fuks AB, Papagiannoulis L, Duggal MS. Pulpotomy in primary teeth: Review of the literature according to standardized assessment criteria. Eur Arch Paediatr Dent 2006;1:64-72.
- Coster PD, De Coster P, Rajasekharan S, Martens L. Laser-assisted pulpotomy in primary teeth: A systematic review. Int J Paediatr Dent 2013;23:389-99. [doi.org/10.1111/ipd. 12014].
- Kusum B, Rakesh K, Richa K. Clinical and radiographical evaluation of mineral trioxide aggregate, biodentine and propolis as pulpotomy medicaments in primary teeth. Restor Dent Endod 2015;40:276-85.
- Jacsó P. Google scholar duped and deduped – The aura of “robometrics”. Online Inf Rev 2011;35:154-60.
- Delikan E. Hemostatic agents for pulpotomy treatment in primary teeth. Yeditepe Dent J 2018;14:109-16.
- Deery C. Mineral trioxide aggregate a reliable alternative material for pulpotomy in primary molar teeth. Is mineral trioxide aggregate more effective than formocresol for pulpotomy in primary molars? Evid Based Dent 2007;8:107.
- Tagger E, Tagger M, Sarnat H. Pulpal reactions to glutaraldehyde and paraformaldehyde pulpotomy dressings in monkey primary teeth. Endod Dent Traumatol 1986;2:237-42.
- Waterhouse PJ. Formocresol and alternative primary molar pulpotomy medicaments: A review. Endod Dent Traumatol 1995;11:157-62.
- Kola SR, Reddy NV, Sneha T, Reddy MA, Niharika P, Kumar PJ. A histopathological comparison of pulpal response to formocresol and sodium hypochlorite used as pulpotomy medicaments: In primary teeth – A clinical trial. A histopathological comparison of pulpal response to formocresol and sodium hypochlorite used as pulpotomy medicaments: In primary teeth – A clinical trial. J Indian Soc Pedod Prev Dent 2019;37:198-204.

18. Gopalakrishnan V, Anthonappa R, Ekambaram M, King NM. Qualitative assessment of published studies on pulpotomy medicaments for primary molar teeth. *J Investig Clin Dent* 2019;10:e12389.
19. Subramanyam D, Gurunathan D, Gaayathri R, Vishnu Priya V. Comparative evaluation of salivary malondialdehyde levels as a marker of lipid peroxidation in early childhood caries. *Eur J Dent* 2018;12:67-70.
20. Ramadurai N, Gurunathan D, Samuel AV, Subramanian E, Rodrigues SJ. Effectiveness of 2% articaine as an anesthetic agent in children: Randomized controlled trial. *Clin Oral Investig* 2019;23:3543-50.
21. Ramakrishnan M, Dhanalakshmi R, Subramanian EM. Survival rate of different fixed posterior space maintainers used in paediatric dentistry – A systematic review. *Saudi Dent J* 2019;31:165-72.
22. Jeevanandan G, Thomas E. Volumetric analysis of hand, reciprocating and rotary instrumentation techniques in primary molars using spiral computed tomography: An *in vitro* comparative study. *Eur J Dent* 2018;12:21-6.
23. Princeton B, Santhakumar P, Prathap L. Awareness on preventive measures taken by health care professionals attending COVID-19 patients among dental students. *Eur J Dent* 2020;14:S105-9.
24. Saravanakumar K, Park S, Mariadoss AV, Sathiyaseelan A, Veeraraghavan VP, Kim S, *et al.* Chemical composition, antioxidant, and anti-diabetic activities of ethyl acetate fraction of *stachys riederi* var. *japonica* (Miq.) in streptozotocin-induced type 2 diabetic mice. *Food Chem Toxicol* 2021;155:112374.
25. Wei W, Li R, Liu Q, Seshadri DV, Veeraraghavan VP, Surapaneni KM, *et al.* Amelioration of oxidative stress, inflammation and tumor promotion by tin oxide-sodium alginate-polyethylene glycol-allyl isothiocyanate nanocomposites on the 1,2-dimethylhydrazine induced colon carcinogenesis in rats. *Arab J Chem* 2021;14:103238.
26. Gothandam K, Ganesan VS, Ayyasamy T, Ramalingam S. Antioxidant potential of theaflavin ameliorates the activities of key enzymes of glucose metabolism in high fat diet and streptozotocin – Induced diabetic rats. *Redox Rep* 2019;24:41-50.
27. Su P, Veeraraghavan VP, Krishna Mohan S, Lu W. A ginger derivative, zingerone-a phenolic compound-induces ROS-mediated apoptosis in colon cancer cells (HCT-116). *J Biochem Mol Toxicol* 2019;33:e22403.
28. Mathew MG, Samuel SR, Soni AJ, Roopa KB. Evaluation of adhesion of *streptococcus mutans*, plaque accumulation on zirconia and stainless steel crowns, and surrounding gingival inflammation in primary molars: Randomized controlled trial. *Clin Oral Investig* 2020;24:3275-80.
29. Sekar D, Johnson J, Biruntha M, Lakhmanan G, Gurunathan D, Ross K. Biological and clinical relevance of microRNAs in mitochondrial diseases/dysfunctions. *DNA Cell Biol* 2020;39:1379-84.
30. Velusamy R, Sakthinathan G, Vignesh R, Kumarasamy A, Sathishkumar D, Nithya Priya K, *et al.* Tribological and thermal characterization of electron beam physical vapor deposited single layer thin film for TBC application. *Surf topogr: Metrol prop* 2021;9:025043. <https://iopscience.iop.org/article/10.1088/2051-672X/ac0c61/meta> [Last accessed on 2021 Aug 10].
31. Aldhuwayhi S, Mallineni SK, Sakhamuri S, Thakare AA, Mallineni S, Sajja R, *et al.* Covid-19 knowledge and perceptions among dental specialists: A cross-sectional online questionnaire survey. *Risk Manag Healthc Policy* 2021;14:2851-61.
32. Sekar D, Nallaswamy D, Lakshmanan G. Decoding the functional role of long noncoding RNAs (lncRNAs) in hypertension progression. *Hypertens Res* 2020;43:724-5.
33. Bai L, Li J, Panagal M, Biruntha M, Sekar D. Methylation dependent microRNA 1285-5p and sterol carrier proteins 2 in type 2 diabetes mellitus. *Artif Cells Nanomed Biotechnol* 2019;47:3417-22.
34. Sekar D. Circular RNA: A new biomarker for different types of hypertension. *Hypertens Res* 2019;42:1824-5.
35. Sekar D, Mani P, Biruntha M, Sivagurunathan P, Karthigeyan M. Dissecting the functional role of microRNA 21 in osteosarcoma. *Cancer Gene Ther* 2019;26:179-82.
36. Duraisamy R, Krishnan CS, Ramasubramanian H, Sampathkumar J, Mariappan S, Navarasampatti Sivaprakasam A. Compatibility of nonoriginal abutments with implants: Evaluation of microgap at the implant-abutment interface, with original and nonoriginal abutments. *Implant Dent* 2019;28:289-95.
37. Parimelazhagan R, Umapathy D, Sivakamasundari IR, Sethupathy S, Ali D, Kunka Mohanram R, *et al.* Association between tumor prognosis marker visfatin and proinflammatory cytokines in hypertensive patients. *Biomed Res Int* 2021;2021:8568926.
38. Syed MH, Gnanakkan A, Pitchiah S. Exploration of acute toxicity, analgesic, anti-inflammatory, and anti-pyretic activities of the black tunicate, *Phallusia nigra* (Savigny, 1816) using mice model. *Environ Sci Pollut Res Int* 2021;28:5809-21.
39. Garg N, Garg A. *Pediatric Endodontics*. Textbook of Endodontics. India: Jaypee Publications; 2014. p. 538.
40. Baumgartner C. *Advanced endodontics: Ruddle on retreatment*. *J Endod* 2002;28:413.
41. Fuks AB, Peretz B. *Pediatric endodontics: Past and present perspectives and future directions*. In: *Pediatric Endodontics*. Springer International Publishing Switzerland 2016; 2016. p. 1-5.
42. Inamoto K, Kojima K, Nagamatsu K, Hamaguchi A, Nakata K, Nakamura H. A survey of the incidence of single-visit endodontics. *J Endod* 2002;28:371-4.
43. Andelin WE, Browning DF, Hsu GH, Roland DD, Torabinejad M. Microleakage of resected MTA. *J Endod* 2002;28:573-4.
44. Ashley PF, Parekh S, Moles DR, Anand P, Behbehani A. Preoperative analgesics for additional pain relief in children and adolescents having dental treatment. *Cochrane Database Syst Rev* 2016;2016:CD008392.
45. Ashkenazi M, Blumer S, Eli I. Post-operative pain and use of analgesic agents in children following intrasulcular anaesthesia and various operative procedures. *Br Dent J* 2007;202:E13.
46. Ram D. Post-operative pain and analgesic use in children. *Br Dent J* 2007;202:276-7.
47. Sruthi MA, Mani G, Ramakrishnan M, Selvaraj J. Dental caries as a source of *Helicobacter pylori* infection in children. *Int J Paediatr Dent* 2022. doi: 10.1111/ipd.13017. Online ahead of print.