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Dr. Mohamad Arshid Khanday
Postgraduate Student, Department of Pedodontics and Preventive Dentistry, Bapuji Dental College and Hospital, Davangere, Karnataka, India

Dr. Mohammad Muzamil Khan
Lecturer, MDS Pedodontics and Preventive Dentistry Bapuji Dental College and Hospital, Davangere Karnataka, India

Dr. Afreen Kauser
MDS Lecturer, MDS Orthodontics College of Dental Sciences Davangere, Karnataka, India

Dr. Zubair Ahmed
Senior Lecturer MDS, Sb Patil Dental College and Hospital Bidar, Karnataka, India

Dr. Anisa Nabi
B.D.S. Junior Resident-SKIMS Medical College Srinagar, Jammu and Kashmir, India

Correspondence
Dr. Mohamad Arshid Khanday
Postgraduate Student, Department of Pedodontics and Preventive Dentistry, Bapuji Dental College and Hospital, Davangere, Karnataka, India

Influence of rubber dam on objective and subjective Parameters of stress during Pulpectomy procedure in children: A randomized controlled clinical study

Dr. Mohamad Arshid Khanday, Dr. Mohammad Muzamil Khan, Dr. Afreen Kauser, Dr. Zubair Ahmed and Dr. Anisa Nabi

Abstract
Aim: The purpose of the present study was to evaluate the effect of rubber dam application on anxiety in 6-10 year old children during Pulpectomy.
Methodology: The study was conducted on 40 children aged 6-10 years old who required Pulpectomy of at-least one mandibular primary molar under local anesthesia. The children were randomly divided into two groups with 20 children in each group. The participating children treated with cotton rolls and saliva ejector, as isolation method was used as a control group, whereas the children were Pulpectomy was carried out under rubber dam isolation was used as an experimental group. The psychological assessment was done by recording base line anxiety before the treatment and at the completion of biomechanical preparation using Venham's anxiety scale (VAS). The physiological assessment was done by recording heart rate using fingertip pulse Oximeter. All the recordings were noted by an independent observer who assessed the child throughout the Pulpectomy. Independent t-test at 0.05% level of significance was used to compare means of two groups.
Results: Comparison of Venham's anxiety score of participants, showed statistically no significant difference (P=0.796). The mean pulse rate recorded at different time points between the two groups was also statistically non-significant (P=0.923, 0.957, 1.00 respectively).
Conclusion: The current study confirmed that, in the hands of an experienced dentist Pulpectomy can be less stressful for children when rubber dam is used as an isolation technique.

Keywords: Anxiety, Pulpectomy, pulse rate, rubber dam

Introduction
Anxiety by definition is a state or feeling of apprehension, uneasiness agitation uncertainty and fear resulting from the anticipation of some threat or danger, usually of intrapsychic rather than external origin whose sources are generally unknown. Dental anxiety is a dynamic phenomenon, which involves multiple interacting variables such as fear of unknown, anticipation of pain, etc. Anxiety in children produces certain physiological changes, the most common being heart rate, blood pressure and oxygen saturation [1].
Restorative dentistry procedures deliver the most significant potent trigger for dental anxiety by sight, sound, vibrations and discomfort produced by rotary instruments, rubber dam, injection etc. Dental fear and anxiety is reported to be higher in younger children and probably experience higher level of fear and anxiety than older children [2].
Dental procedures cannot be properly executed unless the moisture is controlled. When using modern adhesive technique a proper isolation method is an important precondition for long term survival of restoration. Proper isolation is also an essential prerequisite for successful endodontic treatment. Rubber dam, suction tips and absorbents are effectively used in moisture control. It is well known that rubber dam use reduces microbial contamination and the potential for the patients swallowing irrigants, hand files, infected tooth debris etc. But despite this many studies have identified the major barriers of using rubber dam as a Challenging technique; occasionally time consuming, disliked by some patients and to certain extent cost factor. Dentists often omit rubber dam particularly in pediatric dentistry thinking that it would stress the patient and may result in lack of cooperation [3].
Many studies have reported the effect of rubber dam placement and stress related behaviours during dental procedures.

There is paucity of studies evaluating the effect of rubber dam placement on physiological parameters indicating stress in children as compared to adult studies during dental procedures [3].

The purpose of the present study was to evaluate the effect of rubber dam application on anxiety in 6-10 year old children during pulpectomy.

Methodology

After obtaining ethical approval letter was from RDSC (Research Development and Sustenance Committee of the college all the patients and their parents received both written and verbal information about the procedure before the inclusion. Those who agreed, a written consent from the parents/guardians was obtained along with a brief medical and dental history of patients.

Sample size

Sample size determination: Sample size was scientifically determined using the study conducted by Mesut *et al.* [4]. Calculated sample size was 40.

Inclusion criteria

- Children under ASA category 1 (without any systemic disease).
- The children between 6-10 years of age with symptom less primary mandibular molars indicated for single visit pulpectomy.
- Children who were visiting first time to the dental clinic.
- Frankel's behaviour rating scale: Definitely positive and Positive child.

Exclusion criteria

- Parents who were not willing to give their consent.
- Children undergoing orthodontic treatment.
- Special child.
- Children allergic to latex rubber.

40 children aged between 6-10 years of age were selected from the out patients who came for their first dental visit to the Department of Pedodontics and Preventive Dentistry. A general examination of all the children was done prior to the study, to assess if he/she fulfills the selection criteria. The purpose of the study and the apparatus being used was explained to the parents and children during their first visit and an informed consent obtained from all the parents of participating children. This study was designed as a prospective, randomized controlled clinical trial with parallel group design. The children were randomly divided into two Groups i.e; those treated using cotton rolls as an isolation method and other group were children were treated under rubber dam isolation. The principle investigator performed the randomization before beginning the study. Each participant received an opaque envelope containing a number to assign him/ her to one of the two groups. After selection, the base line anxiety was recorded using Venham's anxiety rating scale by an independent observer. After screening the child, next appointment was scheduled after seven days to perform the pulpectomy. It was decided that the same treatment be carried in all the children to ensure standardization. All pulpectomies were scheduled in the morning and performed by one pediatric dentist.

The participating children treated with cotton rolls and saliva ejector, as isolation method was used as a control group whereas the children were pulpectomy was carried out under rubber dam isolation was used as an experimental group. After obtaining adequate anesthesia access preparation was done with endoacess and Endo z bur (Dentsply Maillefer, Ballaigues Switzerland). After initial negotiation of canals by using K file ISO number 10 (Dentsply Maillefer, Ballaigues Switzerland) working length was estimated with radiography. The canals were instrumented to a size no.35 K file under Copius irrigation with 2.5% sodium hypochlorite. All the canals were Obturated using zinc oxide eugenol (De Trey Dentsply, Germany) as an obturating material. A postoperative radiograph was taken to assess the technical quality of root canal filling and when satisfactory, a permanent filling was placed [8].

The physiological and psychological parameters of stress (pulse rate and anxiety level) were measured at three different intervals

- Before the start of treatment on the dental chair.
- At the time of placement of cotton rolls or rubber dam.
- After completion of biomechanical preparation.

The Venham's anxiety rating scale was used during the treatment to grade the patient's behavior [1]. All the recordings were noted by an independent observer who assessed the child throughout the treatment. Scores obtained on the basis of Venham' s anxiety scale and pulse oximeter were tabulated and subjected to statistical analysis using independent t-test. Statistical analysis was carried out using statistical package for social sciences (SPSS) Version 16 at $P<0.05$.

Results

Of the 40 participants enrolled in the present study there were 21 boys and 19 girls randomly distributed between the two treatment Groups. There was no significant difference between the two groups regarding gender (P=0.845) Table (1). As shown in Table (2) there was statistically no significant difference (P=0.879) regarding baseline anxiety between the two treatment groups. Comparison of Venham's anxiety score of participants during the pulpectomy procedure did not showed any significant difference (P=0.796) Table (3). Similarly there was no significant difference in the mean scores of pulse rate at different time points between the two groups (P=0.923, 0.957, 1.00 respectively) Table (4).

Table 1: Distribution of patients according to gender

Sex	Group				Total	
	Cotton roll isolation		Rubber dam isolation			
	Count	%	Count	%	Count	%
Female	10	45.0	9	40.0	19	42.5
Male	10	55.0	11	60.0	21	57.5
Total	20	100.0	20	100.0	40	100.0

P=0.845

Table 2: Comparison of baseline anxiety between the two groups.

Anxiety baseline	Group				Total	
	Cotton roll isolation		Rubber dam isolation			
	Count	%	Count	%	Count	%
1	6	30.0	6	30.0	12	30.0
2	11	55.0	11	55.0	22	55.0
3	3	15.0	3	15.0	6	15.0
Total	20	100.0	20	100.0	40	100.0

p = 0.879

Table 3: Comparison of anxiety between the groups during pulpectomy

Clinical Anxiety	Group				Total	
	Cotton roll isolation		Rubber dam isolation			
	Count	%	Count	%	Count	%
0	7	35.0	8	40.0	15	37.5
1	12	60.0	11	55.0	23	57.5
2	1	5.0	1	5.0	2	5.0
Total	20	100.0	20	100.0	40	100.0

p = 0.796

Table 4: Comparison of pulse rate between the groups during pulpectomy

Pulse Rate	Group						p value
	Cotton roll isolation			Rubber dam isolation			
	N	Mean	S D	N	Mean	S D	
Initial	20	93.2	4.95	20	93.1	4.81	0.923
After the placement of cotton roll or rubber dam	20	89.8	5.94	20	89.7	5.83	0.957
After biomechanical preparation	20	90.2	5.32	20	90.2	5.32	1.000

Discussion

Using rubber dam is advantageous as it provides clear operating field, isolation and prevents accidental foreign body ingestion. Aspiration of endodontic files, irrigation needles, clamps, burs, crowns, inlays, Onlays and posts has been reported resulting during endodontic and prosthodontic procedures without the use of rubber dam [5-8] However, 10-20% of cases require non-surgical intervention, while 1% require surgery. According to Grossman the chances of foreign body entering the digestive system and respiratory tract 87% and 13%. For the endodontic instruments, the prevalence for aspiration is 0.0009/100,000 root canal treatments and the prevalence for ingestion is 0.08/100,000 root canal treatments [9]. An idyllic dental practice guideline recommends the use of rubber dam all through the intraoral procedures. Other recommended protective methods are the use of gauze throat screens or floss ligatures. Accidental ingestion or aspiration of an instrument, and salivary contamination of the operative field during the procedure can be effectively prevented by applying rubber dam [10]. Though rubber dam aids in the maintenance of a patent working field however, at times it is not possible to apply it because of an intense obstinate behavior of the child. Hence this study was carried out to see the behavior of children during pulpectomy procedure and it was observed that there was no significant difference in anxiety levels between the two groups while using rubber dam or cotton rolls as an isolation method.

Younger children exhibit a higher level of fear and anxiety than the older children. For this reason age group of 6-10 years was selected [11]. All children were chosen with no past dental history as negative experience of the previous visit may lead to dental anxiety and fear. Wright *et al*. and Freeman pointed to the importance of first dental experience where more aversive procedure resulted in less positive behavior [12]. Regarding evaluation of scales to measure the dental anxiety and fear, it has been shown that none of the scales is better than the other nor can act as a gold standard. Venham's anxiety scale which was used in this study is an effective and reliable means of assessing the anxiety in children. The physiological changes were measured by using pulse Oximeter which is considered to be an excellent means of monitoring pulse rate. Pulse rate has been used as an outcome measure in numerous medical, paramedical and dental studies of fear and anxiety [13-15].

A study was conducted to determine the prevalence and frequency of rubber dam usage for endodontic procedures among general practitioners, specialized practitioners, undergraduate final year students and endodontists in the state of Odisha, India. It was found that the use of rubber dam was 15.4% in paediatric patients and 34.4% in adult patients. 68% of subjects received knowledge about rubber dam usage in undergraduate school. 75% felt that rubber dam should be compulsory before endodontic treatment & 90% were willing to gain knowledge through training and continuing dental education programs [16]. The main reason for not using rubber dam among is that, it might be stressful in children [17-18].

According to our knowledge, this is the first study on a clinical trial measuring subjective and objective stress parameters in patients in conjunction with rubber dam application during standardized dental treat-ment. The results of this study are encouraging, but it is reasonable to suspect that medically-compromised patients who start lower on the oxygen saturation curve and have a decreased ability to cope with physical stress may respond differently.

Conclusion

The current study confirmed that, in the hands of an experienced dentist pulpectomy can be less stressful for children when rubber dam is used as an isolation technique.

References

1. Prabhakar AR, Marwah N, Raju OS. A comparison between audio and audiovisual distraction techniques in managing anxious pediatric dental patients. J of Indian Soc. of Pedod and Prevent Dent. 2007; 25(4):177.
2. Ram D, Shapira J, Holan G, Magora F, Cohen S, Davidovich E. Audiovisual video eyeglass distraction during dental treatment in children. Quintessence Int. 2010; 41(8):673-678.
3. Patricia A, Andreas K, Adrian L, Rainer S. Influence of rubber dam on objective and subjective parameters of stress during dental treatment of children and adolescents-a randomized controlled clinical pilot study. Int. J Paediatr Dent. 2013; 23:110-115.
4. Mesut O, Ceren D, Aysegul O. Does placement of rubber dam effect the arterial oxygen saturation in children? A clinical study. Pediatr Dent J. 2011; 21(2):91-93.

5. Bains *et al*. Accidental swallowing of endodontic instrument. European J of General Dent. 2014; 3(3):202-4.
6. El-Ghamrawy AS, Negm SAM, Meabed M. Accidental Swallowing of a Rubber Dam Clamp by a 4.5 Years Old Child: A Case Report. J Dent Oral Health. 2015; 1(2):1-3.
7. Panse A *et al*. Accidental ingestion in pediatric dental patients. Journal of Dental & Allied Sciences. 2012; 1(2):79-81.
8. Tiwana KK, Morton T, Tiwana P. Aspiration and ingestion in dental practice. A 10 year institutional review. J Am Dent Assoc. 2004; 135:1287-91.
9. Bhatnagar S, Das UM, Chandan GD, Prashanth ST, Gowda L, Shiggaon N. Foreign body ingestion in dental practice. J Indian Soc Pedod Prev Dent. 2011; 29:336-8.
10. Saraf HP, Nikhade PP, Chandak MG. Accidental Ingestion of Endodontic File: A Case Report in Dentistry, 2012, 1-3.
11. Al-Khotani A, Bello LA, Christidis N. Effects of audiovisual distraction Onchildren's behaviour during dental treatment: a randomized controlled Clinicaltrial. Acta Odontol Scand. 2016; 74(6):494-501,
12. Howard KE, Freeman R. An evaluation of the PALS after treatment modelling intervention to reduce dental anxiety in child dental patients. Int. J Paediatr. Dent. 2009; 19(4):233-42,
13. Foster RL, Park JH. An integrative review of literature examining psychometric properties of instruments measuring anxiety or fear in hospitalized children. Pain Management Nursing. 2012; 13(2):94-106.
14. Erten H, Akarslan ZZ, Bodrumlu E. Dental fear and anxiety levels of patients attending a dental clinic. Quintessence Int. 2006; 37(4):304-310
15. Carmichael KD, Westmoreland J. Effectiveness of ear protection in reducing anxiety during cast removal in children. Am J Ortho. 2005; 34(1):43-6.
16. Goodday RH, Crocker DA. The effect of rubber dam placement on the arterial oxygen saturation in dental patient. Oper Dent. 2006; 31:176-179.
17. Sanghvi AM, Nagda RJ, Raju PJ. A cross-sectional study on frequency of rubber dam usage among dentists practicing in Maharashtra, India. Saudi Endodontic Journal. 2018; 8(1):39.
18. Shashirekha G, Jena A, Maity AB, Panda PK. Prevalence of rubber dam usage during endodontic procedure: a questionnaire survey. J Clin. Diag. Res. 2014; 8(6):ZC01.