

BLOCK VS INFILTRATION ANESTHESIA FOR MANDIBULAR MOLAR AREA OF SCHOOL AGE CHILDREN

¹*Prof. Dr. Baydaa Ali Othman, ²Marwa Zuhair Mahmood, ³Hajar Dawood Sultan, ³Rusul Sabah Badr and ³Saleel Emad Abduljabbar

^{1,3}College of Dentistry, Ibn Sina University of Medical and Pharmaceutical Sciences, Iraq.

²BDS, Diploma, Pediatric Dentistry, Iraq.

*Corresponding Author: Prof. Dr. Baydaa Ali Othman

College of Dentistry, Ibn Sina University of Medical and Pharmaceutical Sciences, Iraq.

Article Received on 30/04/2022

Article Revised on 20/05/2022

Article Accepted on 09/06/2022

ABSTRACT

The aims of this study are to determine the effectiveness and compare between block vs infiltration anesthesia for preventing pain feeling during different dental treatment in mandibular molar area of school age children. Fifty children of both genders were included in this study. All children were healthy without any systemic disease and they showed accepted degree of cooperation. The range of patient's age was 6-12 years. Male / female no. was 23/27. All children were without any systemic diseases. Block anesthesia showed no pain feelings in all dental treatments. Infiltration anesthesia resulted in no pain in some dental treatment, meanwhile, result in some pain feeling in 2 cases pulpotomy/ pulpectomy and 6 cases teeth extraction. The differences between block and infiltration anesthesia in preventing pain feeling during different dental treatment for children was significant at $p \leq 0.05$. Since block injection induces sustained anesthesia that is potentially traumatic to soft-tissues, it seems that infiltration anesthesia could be used as a suitable alternative technique for mandibular primary molar dental procedure as dental filling but not in pulp therapy and teeth extraction because infiltration technique is easier and induces moderate soft-tissue anesthesia.

KEYWORDS: All children were healthy without any systemic disease and they showed accepted degree of cooperation.

INTRODUCTION

Pain control is a mandatory part of dentistry and particularly of paediatric dentistry. Painful treatment has been shown to be important in the etiology of dental fear.^[1]

The mandibular block is the local anesthetic technique of choice, when treating mandibular primary or permanent molars. Depth of anesthesia has been the primary advantage of this technique, while anesthesia of all molars, premolars and canines on the injected side allows for treating multiple teeth of the same quadrant at one appointment.^[2]

Block anesthesia has some disadvantages for children, specifically the lengthy duration of the anesthesia which allows for the greater possibility of postoperative trauma, such as lip or tongue biting. Block is significantly more painful than buccal infiltration, which sometimes affects the child's behavior.^[3]

Furthermore, a successful mandibular block involves a degree of difficulty that makes the injection stressful for both the clinician and the patient.^[4]

Investigations have looked at alternative techniques. Periodontal ligament injection delivered via a high-pressure syringe has been suggested as an alternative to the mandibular block.^[5] However, this type of injection may produce areas of hypoplasia or decalcification on the succedaneous teeth.^[6]

Recently, a computerized local anesthetic delivery system (Wand) has been developed as a possible good alternative for the mandibular block in the lower primary molars and the complicated equipment required for this technique is the main disadvantage.^[7,8]

Infiltration anesthesia has been used successfully to restore maxillary teeth but has been avoided in the mandibular molar regions because of denser bone that does not allow adequate dissemination of the anesthetic. Although not widely accepted, infiltration in the mandibular molar region of primary teeth has been suggested as another means of achieving anesthesia.

There are advantages for using infiltration or suprapariosteal injection rather than a mandibular block. It is relatively easy to administer; it does not numb the tongue and lips; and it offers the possibility of a shorter anesthetic duration.^[3, 9]

Several studies have evaluated the effectiveness of mandibular infiltration as a possible alternative to the mandibular block for the restoration of primary molars.^[10, 11]

AIMS OF THE STUDY

The aims of this study are to determine the effectiveness and compare between block vs infiltration anesthesia for preventing pain feeling during administration of different dental treatment in mandibular molar area of school age children.

MATERIALS AND METHODS

SAMPLES

Fifty children of both genders were selected randomly from patients who referred to the Pediatric dentistry Clinic (Academic Year 2021- 2022), College of dentistry, Ibn Sina University of Medical and Pharmaceutical Sciences. All children were healthy without any systemic disease and they showed accepted degree of cooperation. For each patient the below information were recorded (Table 1).

Table 1: Questionnaire of Block vs. Infiltration Anesthesia.

- Child's name:
- Age:
- Gender:

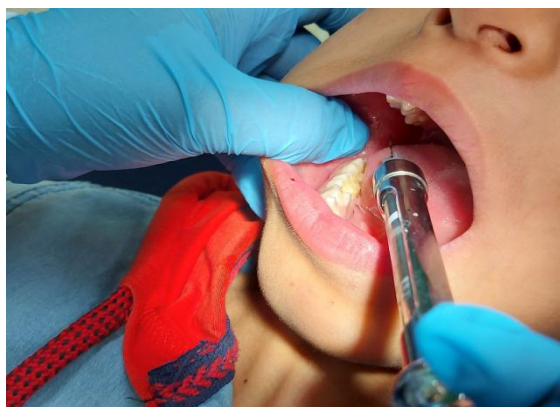


Figure 1: Inferior alveolar nerve block anesthesia.

RESULTS

Fifty children were included in this study. The range of patient's age was 6-12 years. Male / female no. was 23/27. All children were without any systemic diseases.

- **Systemic disease:**
- **Drug allergy:**
 - **Block Anesthesia**
 - **Infiltration anesthesia**
- **Type of treatment:**
 - **Filling**
 - **Pulpotomy/ pulpectomy**
 - **Extraction**
- **Patient feel pain during work Yes No**

METHODS

The sites of injection were anesthetized with topical benzocaine gel before injection. The duration of application of gel was 1 minute. Dental treatments were started 10 min after injection. All the injections were supervised by an academic pedodontist. (Figures 1 and 2)

The amount of pain was measured through patient's expressions, child behaviors and child's body language.

STATISTICAL ANALYSIS

The data were summarized and described using relative frequencies and percentages for categorical variables. When the outcome variables were categorical chi – square test was used to examine differences between groups for statistical significance. Data were analyzed using SPSS software, version 12.0 (SPSS Inc., Chicago, IL, USA) for Windows. Statistical significance was set at $p \leq 0.05$.



Figure 2: Infiltration anesthesia.

Table (2) revealed that block anesthesia result in no pain feeling in all dental treatments include: 10 cases extraction, 2 cases pulpotomy/ pulpectomy and 10 cases teeth extraction.

Infiltration anesthesia result in no pain in 13 cases filling, 3 cases pulpotomy/ pulpectomy and 4 cases teeth extraction, meanwhile, result in some pain feeling in 2 cases pulpotomy/ pulpectomy and 6 cases teeth extraction.

The differences between block and infiltration anesthesia in preventing pain feeling during different dental treatment for children was significant at $p \leq 0.05$.

Table 2: demonstrated the anesthesia administration technique and type of dental treatment performed with or without pain during work.

Anesthesia type	Dental treatment	Pain feeling		Total no. 50 (%)	Chi – square test
		Yes (no.)	No (no.)		
Block	Filling	0	10	22 (44%)	P = 0.00 (Significant)
	Pulpotomy / Pulpectomy	0	2		
	Extraction	0	10		
	Total	0	22		
Infiltration	Filling	0	13	28 (56%)	
	Pulpotomy / Pulpectomy	2	3		
	Extraction	6	4		
	Total	8	20		
Total (no. 50)		8	42		
Total (%)		16%	84%		
Chi – square test		P = 0.000 (Significant)			

Statistical significance was set at $p \leq 0.05$

DISCUSSION

In this study, the efficacy of infiltration and nerve block induced anesthesia to perform mandibular primary molars different dental treatments were compared. Since injection is known as a stressful phase in pediatric dentistry, well controlled pain during injection is an important effective factor in getting the cooperation of the child. Thus, the dentist who can perform an injection with minimum pain, stress, and anxiety is more successful. The most common technique for mandibular anesthetic injection in children is nerve block. Considering that block injection induces relatively sustained anesthesia and may also cause soft-tissue traumatic injuries, the necessity of an alternative technique is felt.^[12]

In this study, concerning range of patients' age was 6 – 12 years old. This could be revealed that most dental students preferred school age children those showed accepted degree of cooperation.

The present study showed significant difference between block and infiltration induced anesthesia for different dental treatment. Even most student preferred infiltration technique because it easier and caused less pain during injection than block. This finding is consistent with the results of Sharaf, 1997; Jones et al., 1995 and Ram and Peretz, 2001.^[13-15]

Concerning feeling of pain during dental procedure, block anesthesia techniques revealed significantly no pain feeling for all dental treatment performed in this study, meanwhile infiltration techniques showed some pain feeling in pulp therapy and teeth extraction; that's may be attributed to not very dense buccal cortical plate of the child's mandible compared with adult and result in

effective anesthesia to certain limit as that of block technique.^[16, 17]

CONCLUSIONS

Since block injection induces sustained anesthesia that is potentially traumatic to soft-tissues, it seems that infiltration anesthesia could be used as a suitable alternative technique for mandibular primary molar dental procedure as dental filling but not in pulp therapy and teeth extraction because infiltration technique is easier and induces moderate soft-tissue anesthesia.

REFERENCES

- McDonald RE, Avery DR, Dean J. (2000) Local anesthesia for the child and adolescent. In: McDonald RE., Avery DR., eds. Dentistry for the child and adolescent. 7th edition, Chapter.13, St. Louis: Mosby, 274.
- Tzermpos FH, Cocos A, Kleftogiannis M, Zarakas M, Iatrou I (2012). Transient delayed facial nerve palsy after inferior alveolar nerve block anesthesia. *Anesth Prog. Spring*, 59(1): 22-7.
- Wright G.Z., Weinberger S.J., Marti R., Plotzke O. (1991). PEDIATRIC DENTISTRY: SEPTEMBER/OCTOBER, VOLUME 13, NUMBER, 278. 4. Shields PW (1977). Further observation on mandibular anesthesia. *Aust Dent J*, 22: 334-338.
- Haghgoo R (2008). Comparison of periodontal ligament injection and alveolar nerve block in the treatment of mandibular primary molars. *J Dent Shiraz Univ Med Sci*, 9: 76–82.
- Branstorm M, Lindsog S, Nodenvall K (1984). Enamel hypoplasia in permanent teeth induced by

- periodontal ligament anesthesia of primary teeth. *JADA*, 109: 735-736.
6. Asarah T, Allen K, Petersen B, Beiraghi S (1999). Efficacy of a computerized local anesthesia device in pediatric dentistry. *Pediatr Dent*, 21: 421-424.
 7. Ashkenazi M, Blumer S, Eli I (2005). Effectiveness of computerized delivery of intrasulcular anesthetic in primary molars. *JADA*, 136: 1418-1425.
 8. McDonald RE and Avery DR (2011). Local anesthesia for the child and adolescent. In: McDonald RE, Avery DR, editors. *Dentistry for Child and Adolescent*. 9th ed. Missouri: Mosby Elsevier, pp. 242–8.
 9. Dudkiewicz A, Schwartz S, Laliberte R (1987). Effectiveness of mandibular infiltration in children using the local anesthetic Ultracaine (articaine hydrochloride). *J Canad Dental Assoc*, 53: 29-31.
 10. Donohue D., Garcia-Godoy F., King DL, Barnwell GM (1993). Evaluation of mandibular infiltration versus block anesthesia in pediatric dentistry. *J Dent Child*, 60: 104–106.
 11. Gbotolorun OM, Olojede AC, Afolabi-Bello M, Arotiba GT (2010). Knowledge and practice of alternatives to the conventional inferior dental block amongst dentists in Lagos. *Nig Q J Hosp Med*, 20: 228–30.
 12. Sharaf AA (1997). Evaluation of mandibular infiltration versus block anesthesia in pediatric dentistry. *ASDC J Dent Child*, 64: 276–81.
 13. Jones CM, Heidmann J, Gerrish AC (1995). Children's ratings of dental injection and treatment pain, and the influence of the time taken to administer the injection. *Int J Paediatr Dent*, 5: 81–5.
 14. Ram D and Peretz B (2001). Reactions of children to maxillary infiltration and mandibular block injections. *Pediatr Dent*, 23: 343–6.
 15. Oulis CJ, Vadiakas GP, Vasilopoulou A (1996). The effectiveness of mandibular infiltration compared to mandibular block anesthesia in treating primary molars in children. *Pediatr Dent*, 18: 301–5.
 16. Smail-Faugeron V, Muller-Bolla M, Sixou JL, Courson F (2015). Split-mouth and parallel-arm trials to compare pain with intraosseous anaesthesia delivered by the computerised Quicksleeper system and conventional infiltration anaesthesia in paediatric oral healthcare: protocol for a randomised controlled trial. *BMJ Open*, 5: e007724.