

Efficacy of Local Anesthesia on Pediatric Post-Operative Recovery from Dental Rehabilitation Under General Anesthesia

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PURPOSE

- The purpose of this study is to determine whether the administration of local anesthesia to children during dental rehabilitation under general anesthesia improves post-operative recovery.

BACKGROUND

- Local anesthetic (LA) is a pharmacological agent commonly used in the oral cavity to establish regional loss of sensation during adult and pediatric dental procedures.¹
- Although it is understood LA reduces the immediate sensation of dental pain, there remains controversy across the literature whether its administration is recommended while pediatric patients undergo dental treatment with general anesthesia (GA).²
- Even though the pediatric stage III general anesthetized brain does not respond to painful stimuli or reflexes, noxious signals from the peripheral perception are still conducted to higher pain pathways as is revealed by physiological fluctuations in patients' vitals of heart rate and end-tidal carbon dioxide.³
- This study will attempt to establish whether LA improves pediatric patients' postoperative GA recovery from dental treatment while controlling for delivery of systemic intraoperative analgesics and standardize a post-operative grading of patient behavior and pain by the Post-Anesthesia Care Unit (PACU) nurses.

REFERENCES

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- American Academy of Pediatric Dentistry Clinical Affairs Committee. *Guideline on use of Anesthesia provider in the administration of office-based deep sedation/general anesthesia to the pediatric dental patient*.
- Watts AK, Thikkurissy S, Smiley M, McTigue DJ, Smith T. Local anesthesia affects physiological parameters and reduces anesthesiologist intervention in children undergoing general anesthesia for dental rehabilitation. *Pediatric Dent*. 2009; 31:414-9.

METHODS

- In this randomized, single-blind controlled study, pediatric patients aged 6 years and younger, who underwent full mouth dental rehabilitation (FMDR) under general anesthesia (GA), were randomly assigned to one of 2 groups:
 - Test group--periodontal ligament (PDL) injections of local anesthesia (2% lidocaine 1:100,000 epinephrine) were administered prior to dental extractions.
 - Control group--no intraoperative delivery of local anesthesia was completed during treatment.
- No systemic analgesics were administered to patients while under GA.
- Patient recovery was graded by Post-Anesthesia Care Unit (PACU) nurses immediately upon waking with the FLACC (Face, Legs, Activity, Cry, Consolability) Scoring System (Fig. 1) and prior to discharge using the Wong-Baker FACES Scale (Fig. 2).

Categories	Scoring		
	0	1	2
Face	No particular expression or smile.	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant frown, quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid, or jerking
Cry	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging, or being talked to; distractible	Difficult to console or comfort

Figure 1: FLACC: Face, Legs, Activity, Cry, Consolability Scale. A behavioral scale for scoring postoperative pain in young children. Scoring (0-2) was completed in each of 5 categories for total scores ranging 0-10. Extracted from Merkel S, Voepel-Lewis T, Shaywitz JR, et al: The FLACC: A behavioural scale for scoring postoperative pain in young children. *Pediatric nursing* 1997; 23:293-797. Printed with permission © 2002, The Regents of the University of Michigan.



Figure 2. Wong-Baker FACES Pain Rating Scale. Self-report pain scale for ages 3 years and older. Children were asked to choose image that best reflected level of pain. Extracted from Wong-Baker FACES Foundation. Wong-Baker FACES(R) pain rating scale. 2015.

DATA ANALYSIS

- Due to the small sample size and limited recorded results, the current data were evaluated with descriptive analysis, including percentages, mean, median, and mode.

RESULTS

- Eleven children, median age 5 years, were recruited into this study: 5 in the lidocaine test group and 6 in the control group.
- The average number of primary teeth extracted per case was 4.
- Eighty percent of patients who received LA had recorded FLACC scores of 0 immediately upon waking.
- Control patients had elevated corresponding FLACC scores ranging from 0 to 10.

CONCLUSIONS

- Based on this study's current tentative data, there is a trend in intraoperative delivery of local anesthesia during pediatric FMDR under GA reducing children's immediate post-operative pain.

LIMITATIONS AND FUTURE RESEARCH

- Current study suffered from:
 - small sample size with strict inclusion criteria
 - difficulty in accurately assessing patients' pain
 - PACU nurses grading individual patients differently
- Ongoing data collection must be completed to determine statistical support