

Post Operative Pain and Pain Management in Children After Dental Extractions Under General Anaesthesia

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ABSTRACT

Background-The purpose of this research sought to ascertain the frequency, intensity, and length of postoperative discomfort among kids receiving general anaesthesia for dental procedures.

Methodology-Thirty-three American Society of Anaesthesiology (ASA) Class I and II children aged four to six who needed several dental treatments, including at least one tooth extraction, pulpectomy, and/or pulpotomy of the primary dentition, were included in this prospective cross-sectional research investigation. Children with developmental delays, cognitive impairments, premature births, psychiatric drug usage, or documented starting pain or painkiller use were excluded.

Results-According to the findings, 48.5% of patients experienced moderate-to-severe postoperative pain, which is characterised as FPS-R ≥ 6 . Pain subsided over 3 days. Postoperative pain scores increased significantly from baseline ($P < .001$, Wilcoxon matched pairs signed rank test). Moderately good correlation between the 2 pain measures existed 2 and 12 hours from discharge (Spearman rho, correlation coefficients of 0.604 and 0.603, $P < .005$).

Conclusion-Children do experience moderate-to-severe pain postoperatively. Although parents successfully used pain scales, they infrequently administered analgesics.

Keywords: Postoperative pain, GA, ASA

1. INTRODUCTION

"A subjective perception that a combination of both emotional and sensory factors connected with context of cultural and surroundings" is the definition of pain. It is both an abstract idea and a tangible sensation. Although actual or potential tissue damage causes pain, natural mechanisms in the intricate human nervous system alter how pain is perceived.¹

Compared alongside children's perceptions, existing medical procedures reveal that families and healthcare professionals frequently overestimate children's discomfort. This discrepancy arises because young children are unable to completely comprehend, articulate, and communicate their sensations, and professionals are reluctant to recognise and recognise the symptoms of pain in the paediatric population. Due to the fundamental challenge of evaluating pain in children, it may go unnoticed or untreated, leading to the misconception that children and newborns do not experience pain or suffering as much as adults.² The International Association for the Study of Pain acknowledges that the "inability to communicate verbally does not negate the possibility that an individual is experiencing pain and (is) in need of appropriate pain management."³

For younger kids, pain following surgery is frequently a novel experience. Unfamiliar postoperative sensations from general anaesthesia (GA), discomfort at the surgery site, and disoriented might further complicate the process of interpreting and expressing pain. In this demographic, formal pain assessments may be necessary during the postoperative recovery phase.

The purposes of this research were to use valid and dependable pain evaluation instruments both at residence as well as in the clinic to ascertain the frequency, intensity, and length of pain after surgery following paediatric dental rehabilitation under GA.

2. METHODOLOGY

This prospective cross-sectional study was carried out at Department of Pedodontics and Preventive Dentistry, Guru Gobind Singh College of Dental Science and Research Centre, Burhanpur.

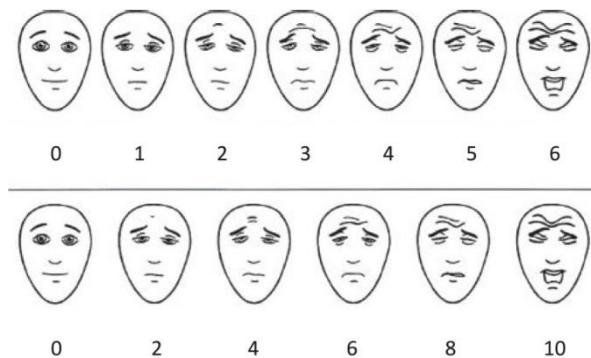
The guardian received the consent form and information sheet to read at home after the research was discussed. And signed the consent form and information letter on the day of the intervention, which is usually planned two to four months following the scheduled consultation, depending on the current wait periods at the surgeon's office. The study excluded patients who were cognitively impaired, prematurely born, taking analgesics on the day of surgery, and under the age of four to six at the time of surgery, as well as those who had ASA physical statuses one and two and needed several dental treatments.

The alpha level for this investigation was chosen at .05. The goal was to attain 90% power. The estimated sample size of 32 patients was raised to 40 in order to account for 20% of those with parents who didn't complete the survey forms.

In the acute postoperative situation, assessment instruments were chosen to gauge pain in children aged 4 to 6. This study employed an observational-behavioral pain evaluation procedure in the house following release from dental rehabilitation under GA, as well as a validated faces pain scale self-report questionnaire. The only pain after surgery evaluation procedures taken into consideration were those that showed concept validity, test-retest reliability, internal consistency, interpretability, feasibility, and discriminant validity (i.e., pain versus no pain).

Self-Report Tools- Children's self-report of their pain is the gold standard and preferred over observational reports, given that pain is a subjective experience.

Faces Pain Scale-Revised



Faces Pain Scale-Revised Instructions:

"These faces show how much something can hurt. This face (point to left-most face) shows no pain. The faces show more and more pain (point to each from left to right) up to this one (point to right-most face) – it shows very much pain. Point to the face that shows how much you hurt (right now)".

Parents' postoperative pain measure

Parents' Postoperative Pain Measure Instructions:

Answer yes or no to the following fifteen questions.

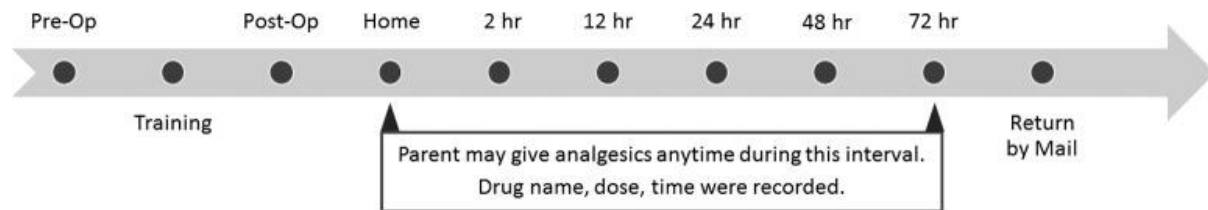
Add the number of 'yes' to acquire a total score.

Does your child:

- ☐ Whine and complain more than usual?
- ☐ Cry more easily than usual?
- ☐ Play less than usual?
- ☐ Not do the things s/he normally does?
- ☐ Act more worried than usual?
- ☐ Act more quiet than usual?
- ☐ Have less energy than usual?
- ☐ Refuse to eat?
- ☐ Eat less than usual?
- ☐ Hold the sore part of his/her body?
- ☐ Try not to bump the sore part?
- ☐ Groan or moan more than usual?
- ☐ Look more flushed than usual?
- ☐ Want to be close to you more?
- ☐ Take medications when normally refuses?

Data on pain were collected in 2 stages. The presence or absence of preoperative pain and analgesic use was acquired in the screening and final recruitment appointments. Then, postoperative pain was measured by the designated parent/caregiver immediately in the recovery area and subsequently at home upon discharge from the clinic.

Assessment timeline



3. RESULTS

323 children in all showed up for the first consultations with paediatric dental residents. 55 of them were approved on the basis of their medical needs, age, and English proficiency. Six were later determined to be unsuitable study participants due to inadequate English proficiency and physical conditions like discomfort, developmental retardation, or a predisposition to malignant hyperthermia. Because they (a) sought private practice, (b) chose oral/nitrous oxide sedative for mild sedation rather than general anaesthesia, or (c) were unavailable during the 12-month study period, seven individuals were not accessible. Four parents declined to participate in the study for no apparent reason.

Table 1-Demographic and Anesthetic Data

Variable	Sample (n = 33)		Lost to Follow-up (n = 5)	
	N	%	N	%
Gender				
Male	17	51.5	1	20.0
Female	16	48.5	4	80.0
Age, y				
4	9	27.3	2	40.0
5	14	42.4	2	40.0
6	10	30.3	1	20.0
Physical status*				
ASA 1	28	84.8	4	80.0
ASA 2	5	15.2	1	20.0
Premedication				
None	21	63.6	2	40.0
Midazolam	12	36.4	3	60.0
Inhalational induction				
Sevoflurane with nitrous	31	93.9	5	100.0
Sevoflurane alone	2	6.1	0	0
Intravenous infusion				
None	2	6.1	0	0
Propofol	0	0	0	0
Propofol + remifentanyl	28	84.8	4	80.0
Remifentanyl alone	3	9.1	1	20.0
Vapors for maintenance				
None	8	24.2	1	20.0
Sevoflurane	4	12.1	0	0
Isoflurane	20	60.6	4	80.0
Sevoflurane/isoflurane	1	3.0	0	0
Local anesthesia used				
None	10	30.3	1	20.0
2% lidocaine 1 : 100,000 epinephrine	23†	69.7	4	80.0
Opioid adjunct				
None	11	33.3	1	20.0
Fentanyl bolus‡	22	66.7	3	60.0
Fentanyl infusion	0	0	1	20.0
Adjunct medications				
Midazolam	1	3.0	0	0
Atropine	7	21.2	2	40
Glycopyrrolate	10	30.3	1	20
Atropine + glycopyrrolate	1	3.0	0	0
Dexamethasone	23	69.7	2	40
Analgesic use in recovery				
None	23	69.7	5	100.0
Ibuprofen, orally	8	24.2	0	0
Ketorolac, intravenously	2	6.1	0	0
Procedure time, min	Mean 124.0, SD 40.7		Mean 120.0, SD 27.5	
0-60	1	3.0	0	0
61-120	12	36.4	2	40.0
121-180	18	54.5	3	60.0
181-240	2	6.1	0	0
Anesthesia time, min	Mean 143.7, SD 43.9		Mean 140.4, SD 27.6	
61-120	11	33.3	1	20.0
121-180	17	51.5	4	80.0
181-240	5	15.2	0	0
Recovery time, min	Mean 55.7, SD 19.2		Mean 60.0, SD 24.1	
21-40	8	24.2	1	20.0
41-60	15	45.5	3	60.0
61-80	7	21.2	0	0
81-100	1	3.0	0	0
>100	2	6.1	1	20.0

* ASA indicates American Society of Anesthesiology.

† One case also received 0.5% bupivacaine 1 : 200,000 epinephrine.

‡ More than 1 hour before the end of the procedure.

Pain Assessment Results

Prevalence

In the 72-hour recuperation time frame, 16/33 (48.5%) of the kids experienced severe to moderate pain, which was characterised as FPS-R > 6. The prevalence of pain was computed using numeric factors that excluded values that were

absent for each evaluation time. The prevalence of moderate-to-severe pain was 40.0% by PPPM ≥ 6 at the 2-hour mark and 29.0% by FPS-R ≥ 6 scores, which peaked two hours after facility dismissal.

Table 2-Spearman Rank Correlation Coefficient Between Faces Pain Scale-Revised and Parents' Postoperative Pain Measure at Concordant Times

	Home	2 Hours	12 Hours	24 Hours	48 Hours	72 Hours
Correlation coefficient, rho _s	0.616	0.604	0.603	0.364	0.382	0.392
P value (2-tailed)	.001*	<.001*	.002*	.057	.041†	.035†
N	26	30	24	28	29	29

* Correlation is significant at the .005 level (2-tailed).

† Correlation is significant at the .05 level (2-tailed).

Table 3-Total Frequencies of Analgesic Doses

Time After Discharge	2 Hours	12 Hours	24 Hours	48 Hours	72 Hours
Number of analgesic doses	6	10	5	2	1
Number of patients represented	6	6	3	1	1

4. DISCUSSION

In the 72 hours following surgery, 48.5% of youngsters expressed moderate-to-severe pain, according to a single study. Additionally, the incidence of pain peaked two hours after discharging and was reported to be 29% by FPS-R and 40% by PPPM.

The significant incidence of postoperative discomfort following GA in paediatric dentistry is highlighted by this study, which also highlights the necessity of a structured evaluation during the recuperation phase. The significance of evaluating pain was highlighted in 1998 when the World Health Organisation designated it as the fifth vital sign. The most painful times are in the morning. According to morbidity research focussing on paediatric dental treatments under GA, moderate-to-severe pain seems to peak at two hours and subsequently decrease in severity over the course of three days.^{4,5}

The pain measurements at the place of residence of the patient, 2, 12, 48, and 72 hours, as well as at 24 hours, showed a decent connection and a reasonably excellent correlation. The clear nature of behavioural verbal and nonverbal cues may be reflected in the correlation's strength at early time periods. Throughout the early stages of recuperation, parents might also be more watchful. The correlation coefficients between PPPM and FPS-R were comparable to the values reported by Chambers et al⁶ who compared PPPM to FPS (original 7-faces version). The study determined Spearman rho correlation coefficient of PPPM and FPS in older children ages 7–12 to be 0.64 and 0.53 on days 1 and 2, respectively ($P < .001$). In the ages 2–6 years, the Spearman rho correlations were 0.72 and 0.62 on days 1 and 2, respectively ($P < .001$).⁷

5. CONCLUSION

In order to document the paediatric postoperative experience following dental GA, this study is the first to have parents evaluate their child patient using the FPS-R and PPPM. During the early stages of recovery, postoperative pain is most severe two hours after the patient is sent home. 48.5% of children experienced moderate-to-severe postoperative pain throughout the 72-hour recovery period, which is characterised as FPS-R ≥ 6 . Although there was moderate-to-severe pain, parents showed a dislike for using analgesics for unidentified reasons.

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