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Original Research Article

Pediatric Dentists' Preferences for Local Anesthesia Use under General Anesthesia: A Cross-sectional Study

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ABSTRACT

Aim: General anesthesia (GA) is a widely used behavior management technique for pediatric patients unable to tolerate dental treatment in conventional settings. However, there is no established consensus on the routine use of local anesthesia during dental procedures under GA. Conflicting evidence regarding its benefits and risks continues to influence clinical practice. This study aims to explore pediatric dentists' preferences regarding local anesthesia (LA) administration during GA and to identify the factors affecting their decisions.

Materials and Methods: A twenty-item survey, the Pediatric Dentists' Local Anesthesia Preference Questionnaire (PD-LAPQ), was specifically developed and validated for this study. Content and face validity were confirmed through expert review and pilot testing. The questionnaire assessed demographics, clinical preferences, and rationale for LA use or avoidance. A convenience sample of pediatric dentists was invited to participate. Statistical analyses included Chi-squared, Mann-Whitney U, and Kruskal-Wallis tests ($p < 0.05$).

Results: Of the 450 invited dentists, 210 responded (46.7%). Of these, 20% always used LA under GA, 1.9% never used it, and 78.1% used it on a case-by-case basis. Most respondents were female (90.5%) with over five years of clinical experience (70.5%). 20% of participants reported always using LA during procedures performed under GA, while 1.9% reported never using it. No statistically significant association was found between the use of LA and the participants' gender, years of experience, or institutional setting.

Conclusion: Findings reveal considerable variation in LA practices under GA among pediatric dentists. Developing standardized, evidence-based guidelines could enhance clinical decision-making and promote safer, more consistent patient care.

Keywords: Dental treatment; General anesthesia; Local anesthesia; Pediatric dentistry

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INTRODUCTION

General anesthesia (GA) is a commonly used behavior management technique that allows dentists to provide dental care to children who cannot tolerate treatment in a routine clinical setting.[1] Although GA ensures a safe and pain-free experience, children may still experience discomfort during emergence from GA.[2,3] Pain is the most frequently reported postoperative complication in pediatric dental procedures performed under GA.[4,5] A number of researchers suggest that using local anesthesia (LA) during these procedures may help control pain and bleeding as well as reducing physiological stress, such as increased heart rate.[6,7,8]

Despite these potential benefits, the current literature presents inconsistent findings. A number of studies report that the use of LA during GA does not significantly reduce postoperative pain and may increase the risk of soft tissue injuries, such as lip and cheek biting. [9,10] Although this complication has raised concerns, no clear evidence has established a strong link between LA use and soft tissue trauma.[4,10] A study by Watts *et al*.[11] reports that the use of

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LA lowered end-tidal CO_2 levels, heart rate, and the need for physician intervention after tooth extraction, although the authors note that these physiological changes may not be clinically important in healthy children. As a result, no clear consensus exists regarding the routine use of LA during dental procedures performed under GA.[4,7,12-14]

Although evidence-based guidelines exist for managing dental pain following trauma and surgical procedures in the general population[15,16], specific recommendations for children receiving dental treatment under general anesthesia remain limited. The guideline titled 'Guidelines for the Management of Children Referred for Dental Extractions Under General Anaesthesia', published by the British Society of Paediatric Dentistry (BSPD), focuses exclusively on extractions and discusses the potential advantages and disadvantages of local anesthesia use, ultimately leaving the decision to the clinical judgment of the dental practitioner.[17]

The use of LA during dental procedures under GA remains a subject of debate, as the decision often relies on the individual preferences of pediatric dentists. While certain studies have examined these preferences, much of the available research is more than a decade old.[18-20] Given the introduction of new anesthetic agents and evolving clinical protocols, updated studies are needed to provide insight relevant to current practice. Therefore, the aim of this study is to investigate pediatric dentists' preferences for using LA during dental procedures under GA and to identify the factors that influence their decision-making.

MATERIALS AND METHODS

This cross-sectional online-based questionnaire survey study was conducted between March and May 2024, and reported according to the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) guidelines. The study protocol was approved by the Ethics Committee of Lokman Hekim

University (Approval number: 2023/253) and adhered to the principles outlined in the Declaration of Helsinki.

The survey incorporated the following methodological safeguards: (1) participant anonymity was maintained by not collecting any email addresses or personally identifiable information; (2) multiple submissions were prevented by requiring an email-based login, allowing only one response per participant; and (3) all questions were marked as mandatory to ensure complete data collection and the participants were unable to submit the survey unless all items were answered. Additionally, elements of the STROBE checklist for cross-sectional studies were incorporated to maintain methodological rigor.

Following a review of previous studies[18-20], an online questionnaire entitled the Pediatric Dentists' Local Anesthesia Preference Questionnaire (PD-LAPQ) was developed for this study. An English version of the PD-LAPQ is provided in Supplementary File 1. To ensure clarity and comprehensiveness, a preliminary version of the questionnaire was administered to ten pediatric dentists who routinely treat children under general anesthesia. Based on the feedback received, the survey was revised to improve its structure and content.

Content validity was established through expert evaluation by experienced professionals in the field. Face validity was assessed through a separate pilot test involving thirty pediatric dentists, focusing on the clarity and usability of the questionnaire. Reliability was evaluated using the test-retest method: thirty pediatric dentists completed the questionnaire twice, with a two-week interval between administrations. The intraclass correlation coefficient (ICC) was 0.89, indicating excellent response stability over time. Additionally, a Cronbach's alpha of 0.80 demonstrated good internal consistency, confirming that the instrument reliably measured pediatric dentists' attitudes toward the use of LA during dental procedures under GA.

According to the Turkish Dental Association, there are 818 pediatric dentists nationwide.[21] This study targeted pediatric dentists working in the public, private, and academic sectors in various cities in Türkiye. Pediatric dentists who perform dental rehabilitation under GA and voluntarily agreed to participate were included in the study. The sample size was determined using G*Power 3.1.9.2. Based on a 95% confidence level (alpha = 0.05), a Cohen's w effect size of 0.32 (medium effect) derived from a similar previous study[18], and a chi-square test with 1 degree of freedom, a minimum of 77 participants was need-

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ed to achieve a statistical power of 0.80. Considering that previous studies have reported response rates ranging from 17% to 42%, a conservative estimate of 17% was adopted.[18-20] Therefore, to reach the target sample size, the questionnaire was distributed to at least 450 pediatric dentists.

The participants were recruited using a convenience sampling approach. A twenty-question survey was created on Google Forms, and distributed to pediatric dentists through the national offices of the Turkish Society of Pediatric Dentistry (TSPD) and the Turkish Dental Association (TDA). The invitation email included a cover letter introducing the investigators, outlining the study's objectives, and assuring the participants of confidentiality. The introduction page of the survey also provided information regarding the voluntary nature of participation, data privacy, as well as the potential risks and benefits. Informed consent was obtained electronically before the participants began the survey. To enhance participation, a reminder email was sent two weeks after the initial invitation.

The questionnaire consisted of four sections. The first section addressed the participants' demographic and professional characteristics, including gender, years of experience, and type of institution. The remaining sections explored various aspects of LA use during dental procedures under GA, including its frequency, the clinical scenarios in which it was administered, and the underlying reasons for its use. The participants were also asked to specify the type of anesthetic agent used, the timing of the administration, and the technique employed.

The data were analyzed using SPSS 22.0 software (SPSS Inc., Chicago, IL, USA). Since the data were not normally distributed, nonparametric tests, the Mann–Whitney U and Kruskal-Wallis tests, were used for group comparisons. Categorical variables were analyzed using the Chi-squared and Fisher's exact tests. The Spearman's rank correlation was used to examine associations between continuous variables. Since each survey item was compared across three sociodemographic variables (gender, years of experience, and institution type), a Bonferroni correction was applied within each comparison family, yielding a corrected significance threshold of $\alpha = 0.0167$ (0.05/3). A p-value of < 0.05 was considered statistically significant.

RESULTS

The questionnaire was distributed by email to 450 pediatric dentists, yielding 210 responses and a response rate of 46.7%. Among the 210 participants, 190 (90.5%) were female, and 20 (9.5%) were male. Most participants (148/210, 70.5%) reported having more than five years of professional experience as pediatric dentists. Regarding institutional affiliation, 114 (54.3%) were employed in university hospitals, 77 (36.7%) worked in private clinics, and 19 (9%) were based in public hospitals. The demographic and professional characteristics of the participants are summarized in Table 1.

Regarding the use of LA during dental procedures under GA, forty-two of the participants (20%) reported always using it, ninety-one (43.3%) used it more than half the time, seventy-three (34.8%) used it less than half the time, and four (1.9%) stated that they never used it. No statistically significant association was found between the overall frequency of LA use and the participants' gender, years of experience, or institutional setting. Among those who reported using LA, articaine was the most frequently preferred anesthetic (149/210, 71%), followed by lidocaine (56/210, 26.7%) and bupivacaine (1/210, 0.5%). Additionally, almost all of the participants (200/210, 95.2%) reported using LA with epinephrine. The choice of anesthetic agent did not differ according to the administration technique or application site. Similarly, no statistically significant associations were found between the anesthetic preference and the participants' demographic or professional characteristics (Table 2).

Table 1. The demographic and professional characteristics of the participants

Gender	**n**	**%**
Male	20	9.5
Female	190	90.5
Experience		
0-5	62	29.5
>5	148	70.5
Institution		
University hospitals	114	54.3
Private offices	77	36.7
Public hospitals	19	9

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Table 3 presents the preferences of the pediatric dentists regarding LA administration techniques across different anatomical regions. Infiltration anesthesia was the most commonly used technique in the upper and lower incisor regions (198/210, 94.3%), as well as in the lower molar region (148/210, 70.5%). Similarly, in the upper molar region, infiltration anesthesia was the most frequently preferred technique (193/210, 91.9%). Although a difference was noted between years of experience and the preferred technique in the upper molar region, with infiltration used by 138 of the 148 dentists (93.2%) with more than five years of experience compared to 55 of the 62 dentists (88.7%) with less experience, this association did not remain statistically significant after Bonferroni correction (p = 0.03; corrected α = 0.0167)

Table 2. The participants' preferences for the type of local anesthetic

		Gender n (%)		Experience n (%)		Institution n (%)		
	Total	**Male**	**Female**	**0-5yr**	**>5yr**	**University hospitals**	**Private offices**	**Public hospitals**
Articaine	149 (71.0)	14 (70.0)	135(71.1)	38 (61.3)	111 (75.0)	78 (68.4)	55 (71.4)	16 (84.2)
Lidocaine	56 (26.7)	5 (25.0)	51 (26.8)	22 (35.5)	34 (23.0)	33 (28.9)	20 (26.0)	3 (15.8)
Bupivacaine	1 (0.5)	0 (0.0)	1 (0.5)	1 (1.6)	0 (0.0)	0 (0.0)	1 (1.3)	0 (0.0)
I never administer it	4 (1.9)	1 (5.0)	3 (1.6)	1 (1.6)	3 (2.0)	3 (2.6)	1 (1.3)	0 (0.0)
p		0.51	0.07	0.69				
LA with epinephrine	200 (95.2)	18 (90.0)	182 (95.8)	60 (96.8)	140 (94.6)	106 (93.0)	75 (97.4)	19 (100.0)
LA without epinephrine	6 (2.9)	1 (5.0)	5 (2.6)	0 (0.0)	6 (4.1)	4 (3.5)	2 (2.6)	0 (0.0)
I never administer it	4 (1.9)	1 (5.0)	3 (1.6)	2 (3.2)	2 (1.4)	4 (3.5)	0 (0.0)	0 (0.0)
p		0.24	0.20	0.53				

Due to low expected cell counts, group comparisons were performed using Fisher's exact test. For multi-category contingency tables, the Fisher–Freeman–Halton exact test was applied. Significance level p < 0.05 (uncorrected); Bonferroni-corrected threshold α = 0.0167 within each comparison family.

Table 3. The participants' preferences for local anesthesia techniques by anatomical regions

		Gender n (%)		Experience n (%)		Institution n (%)		
	Total	**Male**	**Female**	**0-5yr**	**>5yr**	**University hospitals**	**Private offices**	**Public hospitals**
Upper and lower incisor region								
Infiltration	198(94.3)	16 (90)	180(94.7)	59 (95.2)	139(93.6)	106 (93.0)	73 (94.8)	19 (100)
Regional nerve block	1 (0.5)	0 (0.0)	1 (0.5)	0 (0.0)	1 (0.7)	1 (0.9)	0 (0.0)	0 (0.0)
Intraligamentary	3 (1.4)	0 (0.0)	3 (1.6)	0 (0.0)	3 (2.0)	1 (0.9)	2 (2.6)	0 (0.0)
Intraosseous	1 (0.5)	0 (0.0)	1 (0.5)	0 (0.0)	1 (0.7)	0 (0.0)	1 (1.3)	0 (0.0)
Do not prefer	7 (3.3)	2 (10)	5 (2.6)	3 (4.8)	4 (2.7)	6 (5.3)	1 (1.3)	0 (0.0)
p		0.38	0.73	0.55				
Lower molar region								
Infiltration	148 (70.5)	11 (55.0)	137(72.1)	36 (58.1)	112(75.7)	82 (71.9)	53 (68.8)	13 (68.4)
Regional nerve block	46 (21.9)	8 (40.0)	38 (20.0)	20 (32.3)	26 (17.6)	22 (19.3)	19 (24.7)	5 (26.3)
Intraligamentary	9 (4.3)	0 (0.0)	9 (4.7)	3 (4.8)	6 (4.1)	5 (4.4)	3 (3.9)	1 (5.3)
Intraosseous	1 (0.5)	0 (0.0)	1 (0.5)	0 (0.0)	1 (0.7)	0 (0.0)	1 (1.3)	0 (0.0)
Do not prefer	6 (2.9)	1 (5.0)	5 (2.6)	3 (4.8)	3 (2.0)	5 (4.4)	1 (1.3)	0 (0.0)
p		0.20	0.06	0.78				
Upper molar region								
Infiltration	193 (91.9)	19 (95.0)	174(91.6)	55(88.7)	138(93.2)	104 (91.2)	71(92.2)	18 (94.7)
Regional nerve block	5 (2.4)	0 (0.0)	5 (2.6)	4 (6.5)	1 (0.7)	3 (2.6)	2 (2.6)	0 (0.0)
Intraligamentary	5 (2.4)	0 (0.0)	5 (2.6)	0 (0.0)	5 (3.4)	2 (1.8)	2 (2.6)	1 (5.3)
Intraosseous	1 (0.5)	0 (0.0)	1 (0.5)	0 (0.0)	1 (0.7)	0 (0.0)	1 (1.3)	0 (0.0)
Do not prefer	6 (2.9)	1 (5.0)	5 (2.6)	3 (4.8)	3 (2.0)	5 (4.4)	1 (1.3)	0 (0.0)
p		0.83	0.03	0.71				

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Table 4 presents the pediatric dentists' preferences for using LA in various dental procedures. A statistically significant association was observed between the years of experience and the use of LA for composite or compomer restorations (p = 0.001). Among dentists with more than five years of experience, only seven (4.7%) reported using LA for these procedures, compared to twelve (19.4%) of those with less experience. In addition, a trend was observed between the preference for using LA during primary tooth extractions and the type of institution, although this did not remain significant after Bonferroni correction (p = 0.02; corrected α = 0.0167). While 14% of the university-based dentists (16/114) reported not using LA for primary tooth extractions, this rate was only 3.9% among those in private practice (3/77). Notably, all the respondents employed in public hospitals reported consistently using LA for primary tooth extractions.

Table 4. The participants' preferences for local anesthesia use across different dental procedures

			Gender n (%)		Experience n (%)		Institution n (%)		
		Total	**Male**	**Female**	**0-5**	**>5**	**University hospitals**	**Private offices**	**Public hospitals**
Permanent teeth extraction	Prefer	202(96.2)	19 (95.0)	183(96.3)	59 (95.2)	143 (96.6)	108 (94.7)	75 (97.4)	19 (100.0)
	Do not prefer	8 (3.8)	1 (5.0)	7 (3.7)	3 (4.8)	5 (3.4)	6 (5.3)	2 (2.6)	0 (0.0)
	p		0.56	0.67	0.43				
Primary teeth extraction	Prefer	191(91.0)	19 (95.0)	172(90.5)	54 (87.1)	137 (92.6)	98 (86.0)	74 (96.1)	19 (100.0)
	Do not prefer	19 (9.0)	1 (5.0)	18 (9.5)	8 (12.9)	11 (7.4)	16 (14.0)	3 (3.9)	0 (0.0)
	p		1.0	0.21	0.02				
Composite or compomer restoration	Prefer	19 (9.0)	3 (15.0)	16 (8.4)	12 (19.4)	7 (4.7)	8 (7.0)	9 (11.7)	2 (11.7)
	Do not prefer	191(91.0)	17 (85.0)	174(91.6)	50 (80.6)	141 (95.3)	106 (93.0)	68 (88.3)	17 (89.5)
	p		0.40	<0.01	0.53				
Stainless steel crowns	Prefer	58 (27.6)	7 (35.0)	51 (26.8)	17 (27.4)	41 (27.7)	28 (24.6)	22 (28.6)	8 (42.1)
	Do not prefer	152(72.4)	13 (65.0)	139(73.2)	45 (72.6)	107 (72.3)	86 (75.4)	55 (71.4)	11 (57.9)
	p		0.44	0.97	0.28				
Prefabricated zirconia crowns	Prefer	95 (45.2)	8 (40.0)	87 (45.8)	24 (38.7)	71 (48.0)	45 (39.5)	38 (49.4)	12 (63.2)
	Do not prefer	115(54.8)	12 (60.0)	103(54.2)	38 (61.3)	77 (52.0)	69 (60.5)	39 (50.6)	7 (36.8)
	p		0.62	0.22	0.10				
Total/partial pulpotomies	Prefer	77 (36.7)	9 (45.0)	68 (35.8)	26 (41.9)	51 (34.5)	41 (36.0)	29 (37.7)	7 (36.8)
	Do not prefer	133(63.3)	11 (55.0)	122(64.2)	36 (58.1)	97 (65.5)	73 (64.0)	48 (62.3)	12 (63.2)
	p		0.42	0.31	0.97				
Root canal treatment of permanent teeth	Prefer	96 (45.7)	10 (50.0)	86 (45.3)	30 (48.4)	66 (44.6)	48 (42.1)	40 (51.9)	8 (42.1)
	Do not prefer	114(54.3)	10 (50.0)	104(54.7)	32 (51.6)	82 (55.4)	66 (57.9)	37 (48.1)	11 (57.9)
	p		0.69	0.62	0.39				
Root canal treatment of primary teeth	Prefer	84 (40)	7 (35.0)	77 (40.5)	28 (45.2)	56 (37.8)	41 (36.0)	35 (45.5)	8 (42.1)
	Do not prefer	126 (60)	13 (65.0)	113(59.5)	34 (54.8)	92 (62.2)	73 (64.0)	42 (54.5)	11 (57.9)
	p		0.63	0.32	0.41				

Significance level p < 0.05 (uncorrected); Bonferroni-corrected threshold α = 0.0167 within each comparison family.

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Table 5. The participants' reasons for using local anesthesia during dental treatment under general anesthesia.

		Gender n (%)		Experience n (%)		Institution n (%)		
	Total	**Male**	**Female**	**0-5**	**>5**	**University hospitals**	**Private offices**	**Public hospitals**
Hemorrhage control	175 (83.3)	16 (80.0)	159 (83.7)	48 (77.4)	127 (85.8)	92 (80.7)	66 (85.7)	17 (89.5)
p		0.75	0.16	0.59				
Postoperative pain control	167 (79.5)	16 (80.0)	151 (79.5)	46 (74.2)	121 (81.8)	86 (75.4)	63 (81.8)	18 (94.7)
p		1.0	0.26	0.12				
Stabilization of vital signs/protection of the general anesthesia's depth	125 (59.5)	12 (60.0)	113 (59.5)	37 (59.7)	88 (59.5)	65 (57.0)	47 (61.0)	13 (68.4)
p		1.0	1.0	0.629				
Request of the anesthesiologist	13 (6.2)	0 (0.0)	13 (6.8)	3 (4.8)	10 (6.8)	7 (6.1)	4 (5.2)	2 (10.5)
p		0.62	0.76	0.63				
Improved patient recovery	11 (5.2)	1 (5.0)	10 (5.3)	5 (8.1)	6 (4.1)	7 (6.1)	4 (5.2)	0 (0.0)
p		1.0	0.31	0.81				

Significance level $p < 0.05$ (uncorrected); Bonferroni-corrected threshold $\alpha = 0.0167$ within each comparison family. Physicians may have reported more than one reason

Table 6. The participants' concerns regarding the use of local anesthesia during dental procedures under general anesthesia

		Gender n (%)		Experience n (%)		Institution n (%)		
	Total	**Male**	**Female**	**0-5**	**>5**	**University hospitals**	**Private offices**	**Public hospitals**
Postoperative lip and cheek biting	148 (70.5)	16 (80.0)	132 (69.5)	35 (56.5)	113 (76.4)	76 (66.7)	58 (75.3)	14 (73.7)
p		0.36	<0.01	0.42				
Increases patient agitation on recovery	73 (34.8)	8 (40.0)	65 (34.2)	18 (29.0)	55 (37.2)	37 (32.5)	32 (41.6)	4 (21.1)
p		0.61	0.26	0.18				
Increased risk of toxic/ allergic reaction	52 (24.8)	4 (20.0)	48 (25.3)	21 (33.9)	31 (20.9)	33 (28.9)	15 (19.5)	4 (21.1)
p		0.79	0.05	0.31				
Risk of interaction between LA and general anesthetics	37 (17.6)	4 (20.0)	33 (17.4)	11 (17.7)	26 (17.6)	24 (21.1)	13 (16.9)	0 (0.0)
p		0.76	0.98	0.08				
Unnecessary for post-operative pain control	15 (7.1)	3 (15.0)	12 (6.3)	3 (4.8)	12 (8.1)	8 (7.0)	7 (9.1)	0 (0.0)
p		0.16	0.56	0.47				

Significance level $p < 0.05$ (uncorrected); Bonferroni-corrected threshold $\alpha = 0.0167$ within each comparison family. Physicians may have reported more than one reason

The most commonly reported reason for LA use under GA was hemorrhage control (83.3%, 175/210), followed by postoperative pain control (79.5%, 167/210) and the stabilization of vital signs to maintain anesthetic depth (59.5%, 125/210). Fewer respondents cited anesthesiologist request (6.2%, 13/210) or improved patient recovery (5.2%, 11/210) as their rationale (Table 5).

In parallel with these motivations, the participants were also asked to report their concerns regarding LA use under GA. The most frequently cited concern was postoperative lip and cheek biting (70.5%, 148/210), followed by patient agitation during recovery (34.8%, 73/210), the risk of toxic or allergic reactions (24.8%, 52/210), and potential interaction between LA and general anesthetics (17.6%,

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37/210). A smaller proportion of the participants (7.1%, 15/210) considered LA unnecessary for postoperative pain control. A statistically significant association was found between experience level and concern with regard to postoperative lip and cheek biting ($p < 0.01$); 76.4% of the dentists with more than five years of experience (113/148) expressed this concern, compared to 56.5% (35/62) of those with less experience. A similar trend was observed for concerns about toxic or allergic reactions, which were more frequently reported by experienced dentists, although this association did not remain significant after Bonferroni correction ($p = 0.048$; corrected $\alpha = 0.0167$) (Table 6).

DISCUSSION

Although LA is frequently used during dental procedures under GA, the literature provides inconclusive evidence regarding its overall clinical benefits, including postoperative pain reduction, bleeding control, and stabilization of vital signs.[4,8] This study contributes to the ongoing discussion by examining pediatric dentists' preferences and decision-making patterns. In this study, 20% of the respondents reported always using LA, 1.9% stated they never used it, and the majority, 78.1%, indicated that their decisions were made on a case-by-case basis. Additionally, 96.2% reported using LA during permanent tooth extractions under GA, while 3.8% did not use it. Even though clinical guidelines lack a definitive stance on this issue, the invasive nature of permanent tooth extraction makes the absence of LA use in such cases a topic worthy of critical discussion.

This variability may be further shaped by the lack of standardized GA protocols across institutions. Significant differences exist among healthcare centers in the choice of induction and maintenance agents, airway management approaches, and monitoring strategies. Anesthetic agents are often administered alone or in combination to maintain intraoperative stability. Each pharmacological regimen may elicit distinct responses to surgical stimuli, thereby influencing anesthetic depth and the effectiveness of postoperative pain control. As a result, such variations in anesthetic management may have a considerable impact on clinical decisions regarding the use of LA.

Previous studies have also demonstrated variability in pediatric dentists' preferences regarding LA use under GA. One study conducted among members of the American Academy of Pediatric Dentistry (AAPD) reported that 8% of respondents 'always' used LA under GA, whereas 21% 'never' used it.[18] Another study found that 40% of its participants consistently administered LA, while 10% reported never using it.[19] In a more recent investigation, approximately 65.5% of respondents favored the use of LA, citing advantages such as reduced intraoperative bleeding, improved procedural quality, and decreased postoperative pain upon awakening. In contrast, 34.5% opposed LA use due to concerns in regard to soft tissue injuries, hemodynamic fluctuations, prolonged recovery, and the perceived risk of overdose compared to outpatient procedures.[20]

In the present study, articaine was identified as the most commonly preferred local anesthetic among pediatric dentists. In contrast, previous surveys conducted among members of the American Academy of Pediatric Dentistry (AAPD) and the American Society of Dentist Anesthesiologists (ASDA) reported lidocaine as the most frequently used agent.[18,19] This variation in preference may stem from differences in dental education curricula, as well as the accessibility or regulatory approval of certain anesthetic agents in different countries. Although articaine is valued for its ability to diffuse through both hard and soft tissues, systematic reviews have not demonstrated its superiority over lidocaine in pediatric procedures.[14,22] Additionally, concerns regarding a higher incidence of paresthesia associated with articaine may influence clinical preference. Lidocaine, with its well-established safety profile and lower risk of nerve-related adverse effects, remains a more conservative choice in pediatric dentistry.[14,23]

The present study demonstrates that infiltration is the most commonly preferred administration technique across all anatomical regions. This finding is in line with previous studies reporting infiltration as the dominant approach for LA delivery in pediatric dental procedures.[18-20] Furthermore, the type of dental procedure significantly influenced LA use, with the participants most frequently opting for it during permanent and primary tooth extractions. This is con-

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sistent with the findings of Townsend *et al*.[18], who report that pediatric dentists commonly consider LA essential for extractions.[18]

According to the findings of this study, the pediatric dentists most often cited hemorrhage control, postoperative pain management, and stabilization of vital signs as the primary reasons for using LA during GA procedures. Notably, 79.5% of the respondents identified postoperative pain control as their main rationale. Similarly, Faghihian *et al*.[20] reported that 65% of pediatric dentists consider LA effective for managing postoperative pain. However, current evidence does not conclusively support the effectiveness of LA in reducing postoperative pain in pediatric patients undergoing extractions under GA.[24,25] Despite this, a number of researchers advocate for its use due to its hemostatic properties and its potential to stabilize intraoperative physiological responses, particularly in medically compromised children.[18,19]

This study presents several limitations that should be considered when interpreting the findings. First, the generalizability of the results is limited by the sample size. Although approximately 818 pediatric dentists practice in Türkiye[21], only 210 participated in the study, which may reduce the representativeness of the sample. Second, the relatively modest response rate (46.6%) raises concerns regarding nonresponse bias. Third, the voluntary nature of participation may have introduced self-selection bias, as individuals with strong opinions, either in favor of or against the use of LA under GA, may have been more likely to participate. Fourth, despite efforts to recruit participants from diverse practice settings to minimize selection bias, certain demographic imbalances remained. For example, the sample was predominantly female (90.5%) which, although it may reflect the gender distribution of pediatric dentists in Türkiye, could limit the broader applicability of the findings. Another limitation of the present study concerns multiple comparisons. Given the large number of statistical tests performed (78 comparisons across sociodemographic variables), a Bonferroni correction was applied within each comparison family (corrected $\alpha = 0.0167$). Consequently, several associations that appeared nominally significant at the conventional threshold ($p < 0.05$) — including those related to LA technique preference in the upper molar region, institutional differences in primary tooth extraction practice, and concerns regarding toxic or allergic reactions — did not remain statistically significant after correction. These findings should therefore be interpreted as exploratory trends rather than confirmed associations.

Future research should address the current study's limitations through several key approaches. First, investigations incorporating larger, more demographically diverse samples with balanced gender representation would enhance the generalizability of findings. Multicenter and multinational studies encompassing pediatric dentists from various healthcare systems could illuminate regional variations and establish global practice patterns regarding LA administration during GA procedures. Additionally, future survey designs should include items that assess the specific GA protocols used, such as the choice of induction and maintenance agents, airway management techniques, and intraoperative monitoring strategies as these factors may influence decisions regarding LA administration and affect perioperative outcomes.

CONCLUSION

In conclusion, the findings of this study highlight a lack of consensus on the use of LA during GA, suggesting a need for standardized clinical guidelines to optimize patient outcomes. While LA administration is widely used for its potential benefits, such as postoperative pain control, hemorrhage management, and stabilization of vital signs, its necessity in every GA case remains debatable. Understanding the specific conditions in which LA use is clinically beneficial could help prevent unnecessary administration and minimize potential complications, such as soft tissue injuries due to postoperative numbness.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest in relation to this study.

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Pediatrik Diş Hekimlerinin Genel Anestezi Altında Lokal Anestezi Kullanımına Yönelik Tercihleri: Kesitsel Bir Çalışma

ÖZET

Amaç: Genel anestezi (GA), dental tedaviyi geleneksel klinik koşullarda tolere edemeyen pediatrik hastalar için yaygın olarak kullanılan bir davranış yönlendirme tekniğidir. Genel anestezi altında gerçekleştirilen dental işlemlerde lokal anestezi (LA) uygulanmasına yönelik standart bir görüş birliği bulunmamaktadır. LA'nin potansiyel faydaları ve risklerine dair çelişkili bulgular, klinik uygulamaları etkilemeye devam etmektedir. Bu çalışma, pedodontistlerin GA altında LA uygulamasına yönelik tercihlerini ve kararlarını etkileyen faktörleri incelemeyi amaçlamıştır.

Gereç ve Yöntemler: Bu çalışma için özel olarak geliştirilen ve geçerlik ile güvenirliği sağlanan 20 maddelik "Pedodontistlerin Lokal Anestezi Tercihleri Anketi (PD-LAPQ)" kullanılmıştır. İçerik ve yüzey geçerliği uzman görüşü ve pilot uygulama ile doğrulanmıştır. Test-tekrar test analiziyle güvenilirlik değerlendirilmiş olup ICC = 0.89 ve Cronbach alfa = 0.80 bulunmuştur. Anket demografik bilgiler, klinik tercihler ve LA kullanımı ya da kullanılmaması nedenlerini içermektedir. Katılımcılar kolayda örnekleme yöntemiyle belirlenmiştir. İstatistiksel analizlerde ki-kare, Mann–Whitney U ve Kruskal–Wallis testleri uygulanmıştır ($p < 0.05$).

Bulgular: Davet edilen 450 diş hekiminden 210'u (%46,7) ankete katılmıştır. Katılımcıların %20'si her zaman LA kullandığını, %1.9'u ise hiç kullanmadığını belirtmiştir; %78.1'i ise duruma göre karar verdiğini ifade etmiştir. Katılımcıların çoğu kadındı (%90.5) ve %70.5'inin beş yıldan fazla klinik deneyimi vardı. Katılımcıların %20'si GA sırasında her zaman LA kullandığını, %1.9'u ise hiç kullanmadığını bildirmiştir. LA kullanımı ile katılımcıların cinsiyeti, klinik deneyimi veya çalıştıkları kurum arasında istatistiksel olarak anlamlı bir ilişki saptanmamıştır.

Sonuç: Bulgular, pedodontistler arasında GA altında LA kullanımına yönelik önemli bir uygulama farklılığı olduğunu ortaya koymuştur. Klinik karar verme süreçlerini geliştirmek ve hasta güvenliğini artırmak için kanıta dayalı standart kılavuzların oluşturulması gerekmektedir.

Anahtar kelimeler: Diş tedavis; Genel anestezi; Lokal anestezi; Pedodonti

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