

Outcomes Following Treatment with Silver Diamine Fluoride, Sedation, and General Anesthesia

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INTRODUCTION

Early childhood caries (ECC) is a term used to describe rampant caries of primary teeth in infants and toddlers¹. The choice of treatment modality for comprehensive dental care in children with ECC depends on a variety of factors such as patient behavior, age, medical history, and extent of restorative treatment².

For uncooperative children with ECC, sedation and general anesthesia (GA) are most often indicated^{3,4}. However, due to cost, long wait times, and invasive nature of sedation or GA, silver diamine fluoride (SDF) should be considered as an alternative^{3,4}.

SDF can be used to arrest caries, either as an interim treatment prior to sedation or GA or definitively without further intervention⁵.

PURPOSE

- The purpose of this study is to investigate clinical outcomes of patients treated with silver diamine fluoride, treatment under general anesthesia, and those treated under sedation for early childhood caries.
- Post-treatment outcomes compared the number of extractions in patients treated with GA, sedation, and SDF
- Intra-operative measurements compared the number of extractions being completed during SED and SDF procedures
- Post-treatment measurements compared the number of new caries, in patients treated with GA and SDF
- From the information garnered from previous studies, the hypothesis of this investigation is that children under age seven who are treated under general anesthesia for ECC will have fewer new post-treatment caries or extractions

METHOD

This is a retrospective chart review study which was undertaken at approved locations used by the NYU Langone Dental program where NYU Langone pediatric dental residents were located. The electronic dental records, for 1,653 children with early childhood caries who were treated with silver diamine fluoride, sedation, and general anesthesia modalities, were abstracted from 01/01/2010 to 12/31/2020. Chi-square and t-test analyses evaluated the treatment modalities' variables.

TABLE 1: DEMOGRAPHICS

	Overall	SDF	Sedation	GA
Total	1,653 (100.0)	466 (28.2)	577 (34.9)	599 (36.2)
Child's age in years; mean (sd)	3.98 (1.26)	3.43 (1.30)	4.34 (1.18)	3.99 (1.18)
Male	862 (52.5)	285 (55.4)	292 (50.6)	312 (52.1)
Female	774 (47.1)	207 (44.4)	281 (48.7)	286 (47.7)
Hispanic	688 (41.9)	277 (59.4)	205 (35.5)	206 (34.4)
White, Non-Hispanic	105 (6.4)	30 (6.4)	32 (5.5)	43 (7.2)
Medicaid	1363 (83)	386 (82.8)	456 (79)	521 (87)
Commercial Insurance	113 (6.9)	23 (4.9)	80 (13.9)	10 (1.7)

TABLE 2: POST-TREATMENT CARIES FOLLOWING SDF AND GA

(Mean(SD))	SDF	GA	p
# New Caries	189 (41.6)	78 (13.4)	<0.001

TABLE 3: DISPLACED RESTORATION FOLLOWING TREATMENT DURING SED AND GA

(Mean(SD))	SED	GA	p
# Displaced Restorations	25 (4.4)	16 (2.7)	<0.001

TABLE 4: NUMBER OF EXTRactions FOLLOWING SDF, SED, AND GA

(Mean(SD))	SDF	SED	GA	p
# Extractions	34 (7.5)	21 (3.7)	12 (2.1)	<0.001

RESULTS

- Majority of patients studied were between ages 4-7 (58.7%), Hispanic (41.9%), and had Medicaid insurance (83%).
- Review of 466 patients treated with silver diamine fluoride and 601 receiving treatment under general anesthesia showed a greater number of new carious lesions on primary molars in children treated with silver diamine fluoride (41.6%) than those treated with general anesthesia (13.4%). These results were found to be statistically significant (p<0.001).
- Displaced/broken restoration/space maintainers after 12 months of initial treatment and review of 586 charts treated under sedation had (4.4%), 601 treated under general anesthesia had (2.7%), and 466 treated with silver diamine fluoride had (0.08%) broken restorations/space maintainers. A statistical significance (p<0.001) was seen between the silver diamine fluoride and the sedation group. There was a statistical significance (p<0.001) found between the general anesthesia and sedation group.
- There was a statistically significant difference in post-treatment extractions between treatment groups (p<0.001). 3.7% of sedation subjects had at least one post-treatment extraction, while 2.1% of general anesthesia subjects had at least one post-treatment extraction.

CONCLUSIONS

- Children undergoing general anesthesia had a lesser prevalence of post-treatment extractions than children undergoing treatment under sedation.
- There was a higher prevalence of new caries on primary molars in those treated with SDF compared to those treated for caries under general anesthesia.
- Those treated for early childhood caries under general anesthesia had a lower frequency of having displaced restorations/space maintainers than those treated under sedation.
- Results show there was significantly lower prevalence of broken restorations/space maintainers in the silver diamine fluoride compared to the sedation group.

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