Factors that Affect Silver Diamine Fluoride Effectiveness

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Objective

To determine the effectiveness of Silver Diamine Fluoride (SDF). Secondarily, to elucidate the association between tooth-related and patient-related factors and caries arrest.

Background

- Silver Diamine Fluoride (SDF) is a non-surgical, conservative treatment for patients who cannot be treated with more invasive options, such as restorations.
- Contraindications and concerns to its use include: a silver allergy, deep carious lesions and teeth demonstrating signs of pulpitis or necrosis, esthetic concerns due to staining, and parent/patient acceptance.[1,2] Of note, SDF can a temporary treatment and a definitive restoration should be placed for the management of the caries lesion when possible.
- According to the American Academy of Pediatric Dentistry Clinical Practice Guidelines, the effectiveness of SDF is greater than 70%. [1]

Methods

- Retrospective chart review dated from January 2015 to March 2021
- Inclusion criteria : 1) 0-6 years of age 2) ASA I or II 3) 1 follow-up evaluation after SDF application
- 180 subjects
- Patient-related factors noted: age, medical history, behavior and oral hygiene
- Tooth-related factors noted: tooth number, application surface, pain history, SDF application frequency, time elapsed between diagnosis and initial SDF treatment, mean number of visits to complete definitive treatment and final clinical outcome
- Final treatment and outcome of the tooth and the mean number of visits needed to complete the definitive treatment also noted

Results

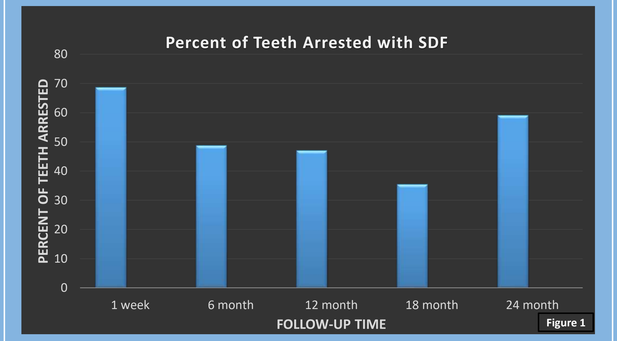

Figure 1

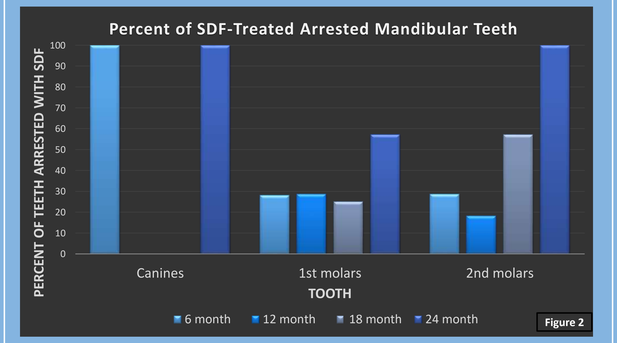

Figure 2

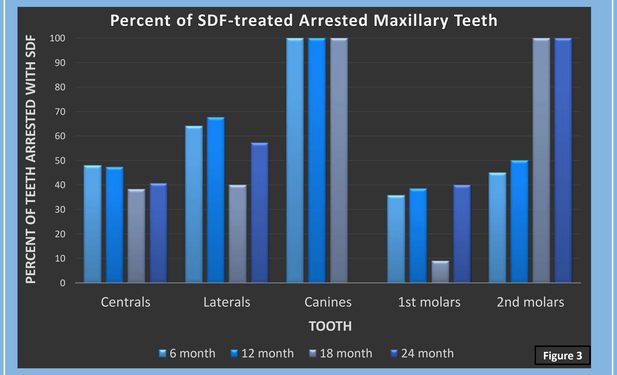

Figure 3

Table 1: Follow-up rate post-SDF application	
6 month follow-up time	63.2%
12 months	27.5%
18 months	16.8%
24 months	13.6%

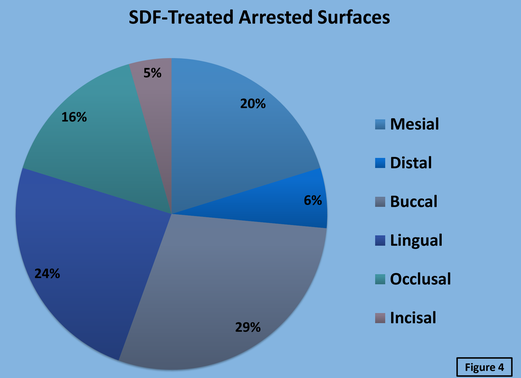

Figure 4

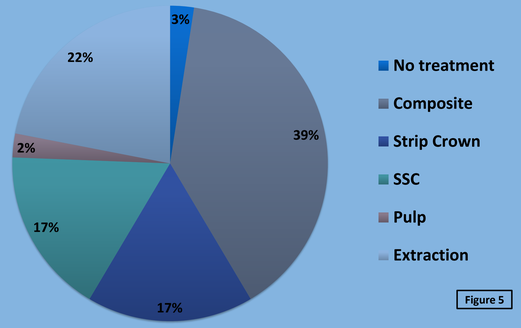

Figure 5

Discussion

- While 68.6% of SDF-treated teeth had arrested caries after one week, only 48.7% remained arrested after 6 months (Fig. 1). This rate of arrest is much lower than the previously observed rate of greater than 70%[1,3].
- A number of factors may influence the rate of arrest in this patient population -- lack of proper follow-up, lack of timely SDF application, poor oral hygiene, carbohydrate-rich diets, and low socioeconomic status.
- More than half (63.2%) were evaluated after 6 months of SDF application, whereas only 13.6% of teeth were evaluated after 24 months of SDF application (Table 1).
- Majority of the SDF-arrested teeth were maxillary anterior teeth, and involved the buccal and lingual surfaces (Figs. 2-4). This is similar to the previous findings[1].
- Most SDF-treated teeth were definitively restored with composite resin (Fig. 5).

Conclusion

The rate of SDF arrest was lower in this study population.

References

1. Crystal YO et al. Use of silver diamine fluoride for dental caries management in children and adolescents, including those with special health care needs. *Pediatric Dentistry* 2017. 39.5: 135E-145E.
2. Sabbagh H et al. Parental acceptance of silver diamine fluoride application on primary dentition: a systematic review and meta-analysis. *BMC Oral Health.* 2020. 20(1):1-12.
3. Gao SS et al. Clinical trials of silver diamine fluoride in arresting caries among children: a systematic review. *JDR Clinical & Translational Research.* 2016. 1(3): 201-210.