

## Clinical Problem

- Silver Diamine Fluoride (SDF) is a non-invasive topical medication used to treat carious lesions (1)
- A major drawback of SDF is permanent black discoloration of the treated tooth surfaces (1)
- The addition of potassium iodide (KI) to SDF is proposed as a method of reducing black discoloration of treated surfaces (1)
- A question is raised regarding the impact of the addition of KI on SDF's efficacy in arresting carious lesions.

## Clinical Question

**To what extent does SDF 38% solution with KI arrest caries lesions and prevent staining in primary or permanent dentition compared to SDF 38% solution alone over 12 months?**

## Evidence found

**Key words and MeSH terms:** Caries lesion, SDF, Silver Diamine Fluoride, KI, Potassium Iodide, Stain\*, Arrest\*, Cari\*

**Search date:** October 23rd, 2023

**Ovid Medline Yield:** 97 results

**Study design restrictions:** Systematic reviews, Clinical Guidelines, RCTs

**Additional searches:** American Dental Association, Evidence-Based Dentistry Journal

**Chosen source:** Haiat et al., (2021)

• The systematic review included two RCTs of interest, which were analysed in detail:

**1. Turton et al., (2020).** Pre-school and primary school-aged children. N (SDF)= 86; N (SDF+KI)=148.

**2. Li et al., (2017).** Community-dwelling elders. N (SDF)= 107; N (SDF) = 108.

## Clinical Bottom Line

- In primary dentition, the addition of KI to SDF reduced its efficacy at arresting caries, but alleviated tooth discoloration.
- In permanent dentition of an elderly population, SDF+KI yielded similar caries arrest to SDF alone, but no reduction in staining was noted.
- Considering mixed findings in the literature, further studies with robust methodology are needed.

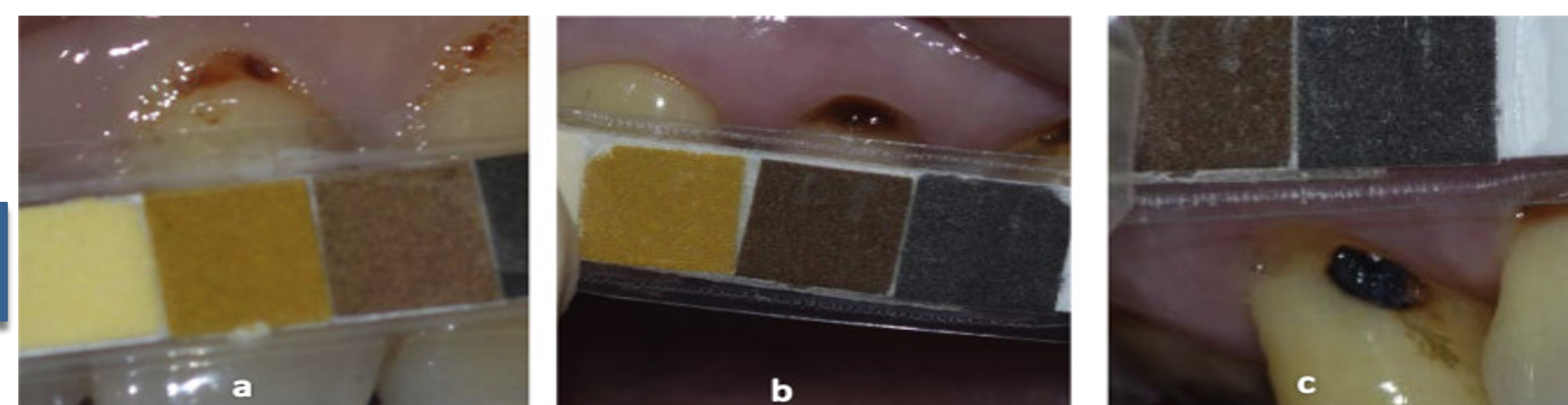


Figure 1: Assessment of caries colour a) brown, b) dark brown, c) black, (Li et al. 2017)

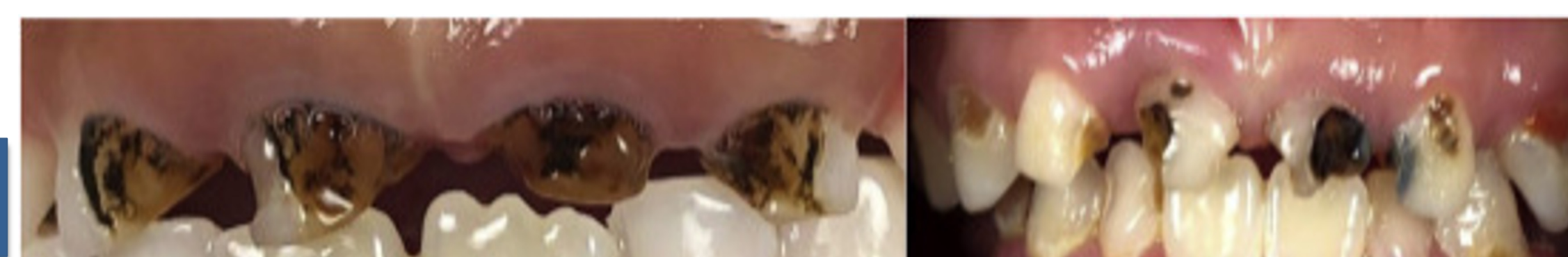


Figure 2: Variation in lesion appearance following SDF addition (Turton et al. 2020)

## Strengths

- Multiple databases (4x)
- Two independent reviewers
- PRISMA diagrams & summary tables
- Primary & secondary outcomes stated clearly
- Cochrane risk of bias tool
- Sufficient time to follow-up in both RCTs analyzed

## Limitations

- Systematic review did not include MeSH terms
- English language papers published 2005-2015
- Grey literature not included in search
- Limited number of RCTs included in review, with bias in: **Turton et al. (2020):** outcome assessors not blinded, unclear if researchers blinded, unclear if confounding variables accounted for
- **Li et al. (2017):** unclear if baseline characteristics are equilibrated, lack of allocation concealment, unclear if confounding variables were taken into consideration

## Results

### RCT by Turton et al. (2020), primary teeth:

- Children received SDF+KI are 44% points less likely to have caries lesions arrest compared with children received SDF alone within 12 months follow up [ RD = -0.44, 95% CI -0.48, -0.39].
- The results are statistically significant, clinically meaningful and clinically decisive (56% risk of control; difference threshold 20%)
- *Staining diminishing* [RR = 6.08, CI 95% 2.36, 15.67]

### RCT by Li et al. (2017), root caries:

- Adults received SDF+KI are 22% points less likely to have new caries lesions compared with placebo within 30 months follow up [RD, SDF+KI = -0.22, CI 95% -0.30, -0.09].
- [RD, SDF = -0.26, CI 95% -0.30, -0.13]
- The results are statistically significant, clinically meaningful but not clinically decisive (43% risk of control; difference threshold 20%).
- *Staining:* No aesthetic advantage of the addition of KI to SDF was reported.

## Clinical Applicability

- Li et al. (2017)'s study focuses on community-dwelling elders in Hong Kong; difficult to generalize to the oral environment of adults of all ages
- Turton et al. (2020)'s study focuses on primary-school children in Cambodia, with the findings limited to primary dentition
- Difference in population characteristics (age, socio-economic factors, diet, oral hygiene practices, fluoridation of water in Hong Kong, attitudes toward dental care, dental aesthetics)
- Differences in treatment protocol (NA typically restores lesion following arrest with aesthetic materials)

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