

Short Communication

Evaluating parental acceptance for silver diamine fluoride therapy – a pilot study

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Abstract

Objectives: To evaluate the association of parents' acceptability for SDF therapy with the location of teeth, child's behaviour, age, gender or socioeconomic status. **Material and methods:** As parents are the decision-makers for their child, we conducted a questionnaire-based survey on 35 parents intending to assess their acceptance for SDF therapy and factors influencing their decision. For pre-treatment aesthetic evaluation of SDF application, the parents were presented with a set of pre- and post-treatment photographs of clinical cases for their observation and comparison along with the printed structured proforma. **Results:** Mean parental acceptance for SDF therapy for front teeth was 2.2 (SD 1.1) and 3.1 (SD 1.2) for back teeth. Cases where the child was fully cooperative, mean ratings were slightly higher for front teeth (2.5 SD 1.6) but lesser for back teeth (2.8, SD 2.2). Results showed that parental acceptance was significantly less ($p < 0.05$) for anterior teeth and in younger children (< 3 years). Gender of the child and socioeconomic status of parents were not associated with their acceptance rates for SDF therapy. **Conclusion:** Longitudinal studies with a postoperative evaluation of SDF therapy acceptance should be conducted for a better understanding of this topic.

Introduction

Early childhood caries (ECC) continue to affect the vast majority of children around the world, especially in the developing world. In India, the prevalence of caries in 5 years old was reported around 50% [3, 9] whereas a recent meta-analysis calculated the pooled prevalence of ECC is 40% among Indian children [1]. This data shows ECC continues to persist as a public health challenge in India and untreated cases of dental caries in young children continue to be an extensive challenge for oral health care professionals and policymakers.

Silver Diamine Fluoride (SDF) has been identified as a reasonable and inexpensive anti-caries agent that can effectively arrest dental caries. SDF has the potential to address the epidemic of untreated early childhood caries in young children especially in populations where surgical management of decay is not an option [4, 13]. The revised guidelines of AAPD(2018) supports and recognize the use of SDF as a favourable remedial caries management method [8]. Furthermore, a systematic review of clinical trials on the effectiveness of SDF therapy reported that regular applications at every 3,6, and 12 months of higher concentration of SDF (i.e 38% SDF) enhances the caries arrest rate [7]. Despite its known benefits and evidence to support its efficacy, usage of SDF is still not frequent in clinical dentistry. The major reason is the permanent dark staining SDF leaves after the application. This visible feature of appearance may not be acceptable for some children and parents and hence, it is necessary to inform them of this outcome of SDF therapy, during the Pre-treatment discussions for the assurance and satisfaction [5].

Few studies had tried to gain an insight about the parental understanding and their acceptance regarding the aesthetics after SDF application. Most of these studies had been conducted in developed countries [1, 2, 5] except one [12]. Therefore we conducted an exploratory pilot questionnaire survey in a government dental hospital of Delhi to assess the parental acceptance of SDF as a caries management method for their child. We also evaluated the association of parents' acceptability with factors such as the location of teeth, child's behaviour, age, gender or socioeconomic status.

Material and methods

Sample characteristics and eligibility criteria

An interview-based questionnaire study was conducted on 35 parent-child pair visiting the Dept of Pedodontics in Delhi. Parent/s whose child was between 2-5 years of age and was suffering from ECC was invited to participate in this study. Children with a history of spontaneous or induced pain due to caries, having tooth mobility, or showing signs of pulpal infection, or with developmental dental defects were not included in the study. The children who were medically compromised and management in the dental clinic was not possible were also not considered eligible for this study. Ethical clearance for this study was obtained from the institutional ethical committee before data collection. Verbal assent from the child and written informed consent of parent/guardian was obtained from each study participant.

Data collection

A questionnaire adapted from a similar study conducted in the United States [5] was translated into local language i.e Hindi (for better understanding of the study participants) for data collection. This questionnaire was then used record baseline characteristics of the child and his/her parents, their socioeconomic status (SES) [11] and parent's awareness regarding various options available for the treatment of dental caries.

For pre-treatment aesthetic evaluation of SDF application, the parents were presented with a set of pre- and post-treatment photographs of clinical cases for their observation and comparison along with the printed structured proforma. The photographs displayed the appearance of the carious primary incisors and primary molars before the treatment along with images of the same teeth showing the occurrence of stained carious enamel and dentin after the SDF application. Parental views related to this therapy were assessed in anticipation of different circumstances concurrent to the child's varying cooperative behaviour including the extreme situations where the sedation and general anaesthesia would have been needed to undertake conventional dental restorations. In all the scenarios, the parents respond separately for anterior and

posterior teeth situations. The parent's opinions about the aesthetics and their acceptance of the SDF staining were summarized based on their responses and interpretations recorded.

Statistical analysis

Recorded data were coded and entered into an SPSS sheet for statistical analysis. Frequency distribution tables were prepared. Bivariate analysis was done using the chi-square test to assess the relationship between dependent and independent variables. The statistical significance was kept at $p < 0.05$.

Results

Out of the 35 parents who participated in this study, 22 were females and rest were males. Sixteen mothers, ten fathers and nine both parents were interviewed. Fifteen parents (42.8%) were in the upper-middle-class bracket, 12 (34.2%) in the lower middle class, 5 (14.2%) in upper lower and only 3 (0.5%) were from lower socioeconomic status. Sixteen children were of age less than 3 years and 19 were above 3 years of age.

After parents were shown post- SDF therapy photographs, 51.4% (n=18) found it acceptable for back teeth of their child and this acceptance rate decrease to 17.1% (n=6) for front teeth. These responses were statistically significant. Although, 34.3% (n=12) of parents were "somewhat acceptable" to SDF therapy for their child's front teeth. The acceptance level increased to 74.1% (n=26) for posterior teeth and 48.6% (n=17) in cases where the child was highly uncooperative for previous dental treatment. In a fully cooperative child, 37.1% (n=13) parents said it's highly unlikely they will opt of SDF therapy for front teeth of their child. Gender of the child and SES of parents was not associated with their acceptance for SDF therapy irrespective of location and child's behaviour.

Parents of children above 3 years of age were significantly more receptive for SDF therapy both for front (n=10, 52.6%) and back teeth (n=15, 78.9%) in comparison to parents of children with less than 3 years of age [front teeth: n=7, 43.7%, back teeth: n=11, 68.7%; $p < 0.05$, chi-square test]. Age of child didn't significantly increase with parental acceptance for SDF therapy as per the child's behaviour or increase in the difficulty of providing conventional treatment.

Mean parental acceptance for SDF therapy for front teeth was 2.2 (SD 1.1) and 3.1 (SD 1.2)

for back teeth. Cases where the child was fully cooperative, mean ratings were slightly higher for front teeth (2.5 SD 1.6) but lesser for back teeth (2.8, SD 2.2). Mean ratings were above three for the front (3.1, SD 1.06) as well as back teeth (3.6, SD 0.6) in cases where the child was uncooperative and conventional treatment was not possible in them.

Discussion

Evidence suggests Silver Diamine Fluoride (SDF) is an effective cariostatic agent. In paediatric dentistry, SDF can solve the problem of treating an uncooperative child who may require the use of unconventional techniques such as sedation or general anaesthesia for treatment of dental caries. The safety aspects of SDF are exceptional and there are no imminent risks or harm related to SDF when applied directly to carious lesions in healthy population groups [7]. The main barrier to its use is the discolouration it causes after application. Hence it's imperative to understand the concern of the parents regarding SDF therapy [5].

In this pilot study, we interviewed the parents of children aged 2-5 years, belonging to a diverse background, educational and socioeconomic status. In terms of site of SDF application, it was observed that the parental acceptance for blackish discolouration by SDF was lower for front teeth in comparison to back teeth. These findings are in corroboration with similar studies in Saudi Arabia [2], United States [5] and western India [12] except one conducted by Alshammari AF et al [1] who found no such difference. The reason for the greater frequency of acceptance for posterior teeth is because of their lower visibility while smiling or talking. It was also realized during the survey that the parental acceptability of the discolouration was not consistent and there was increased tolerance to SDF with accompanying uncooperative behaviour of their child during the dental treatment. This observation was also consistent with other similar studies conducted in a different part of the world [2, 5, 12].

We observed that Irrespective of the age of the child, parents were more reluctant for this new therapy for anterior teeth. In situations where the child was difficult to handle, defiant for dental therapy, the parent's willingness for SDF was enhanced significantly in both the age sections irrespective of the location with higher frequency scores in above 3 years of children. This increase in acceptance in children above 3 years of age could

be because of the fact of the increased awareness about the exfoliation patterns of deciduous teeth as they observed that front teeth start shedding around 5 to 6 years. A similar observation was reported by Bagher *et al.* [2] where the parents were significantly more concerned about discolouration in permanent teeth compared for primary teeth of their child.

We didn't find any association between acceptance for SDF therapy and gender of the child. This finding is contrary to the study conducted by Alshammari *et al.* [1] where they found parents of the female child were more reluctant to SDF application. In our study, SES of the parents was not associated with their acceptance of SDF therapy. This finding is also contrary to similar studies [1, 5, 12]. The probable reason for these observations could be a much smaller sample size in our study compared to these studies. Mean parent acceptance rating in our study was less than the study conducted by Bagher *et al.* [2] but slightly higher than the study by Crystal *et al.* [5]. Cross-cultural differences among study populations could be the reason for this finding.

Conclusion

Results of this study throw insight into the apprehension of children's parents of the black discolouration of the teeth caused by SDF application. Parents were comparatively comfortable with SDF application in their child's posterior teeth. Efforts should be made to increase the application of SDF at least for posterior teeth of children in dental clinics. Post-treatment benefits and painless application of SDF will help allay the fear of parents for future applications. Also, we feel a thorough and perspicuous consent is mandatory that highlights the expected staining of treated carious lesions with pre and post-treatment clinical photographs.

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