

# Current Trends Towards Management Options of Active Carious Lesions among Pediatric Dentists Across India: A Questionnaire Based Survey

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## ABSTRACT

**Introduction:** Various approaches are used by pedodontists across India and all over world for management of active carious lesion considering various factors as patient needs. Current study aimed to evaluate current trends towards management options of active carious lesions among Pediatric Dentists across India.

**Material and methods:** Web based cross sectional survey was done. A thirteen point questionnaire was prepared and sent via email to pediatric dentists registered in Indian Society of Pediatric and preventive Dentistry across India. Data was analysed using descriptive statistics and chi square test with significance level  $p < 0.05$ .

**Results:** A total of 212 pediatric dentists responded out of 1150 sent e-mail and results from their responses concluded that majority of the pedodontists (83.96%) are using noninvasive caries management techniques in private practice, 14.1% responded that they don't use and 1.88% pedodontists didn't responded. Most of the respondents (61.79%) use Silver diamine fluoride (SDF) in their clinical practice where as 35.84% pedodontists not using SDF in their practice.

**Conclusion:** Within limitation of the study, it can be concluded that Current trends towards management of active carious lesion among pediatric dentists is shifting towards minimal invasive dentistry where current material of choice among them is Silver diamine fluoride. Although more studies are encouraged to enhance knowledge and awareness about SDF use in future.

**Keywords:** Active Carious Lesion, SDF (Silver Diamine Fluoride), Pediatric Dentist

## INTRODUCTION

The National Center for Health Statistics reported that 14.3% of 2 to 17-year-old children had not had a dental visit during the previous year and socioeconomic challenges might be associated with this lack of oral health care utilization.<sup>1</sup>

Progression of active carious lesion worsens the dental health of children over time especially in young uncooperative patients and those facing socioeconomic challenges. For that aim modern pediatric dentistry is shifting its way from traditional caries management to Minimal Invasive Dentistry. Various approaches are used by pedodontists across India and all over world for management of active carious lesion considering various factors as patient needs, efficacy of the modality and personal experience of pedodontist. Silver diamine fluoride (SDF), Silver Modified atraumatic Restorative Technique (SMART), HALLS with Silver

diamine fluoride, HALLS without Silver diamine fluoride are some of the minimal invasive modalities for management of active carious lesion use now a days.

Hence, study was aimed to assess Indian pediatric dentists approach towards management of active carious lesions, SDF experiences, viewpoint on its use, professional implications, other current management options and to explore the relationships among these constructs.

## MATERIAL AND METHODS

A cross-sectional survey was conducted where e - mails were sent to 1150 members of the ISPPD. Sent email described the study as follows: "Current Trends towards Management Options of Active Carious Lesions: A Questionnaire Survey among Pediatric Dentists across India." A web-link to an anonymous web-based survey was included in this email. 212 pedodontists responded in total out of total sent E - mails.

The survey consisted of four parts. Part 1 consisted of questions on the respondents characteristics. Part 2 asked about problems and preferences in management of active carious lesion. Part 3 included respondents' general and specific clinical experiences of SDF. The final part evaluated respondents' personal perception about SDF use in their clinics.

The first draft of the survey was pilot tested with ten pediatric dentists and residents. The pilot respondents made

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some suggestions concerning wording and content of the items. The survey was finalized based on these comments to ensure content validity. Ethical clearance was obtained from Institutional Ethical Committee Review Board.

Data was analyzed using Statistical Packages for Social Sciences 21.0 version (IBM Corporation, Java, Chicago, USA) for descriptive and multivariate analysis and level of statistical significance was chosen at  $P < 0.005$ .

**RESULTS**

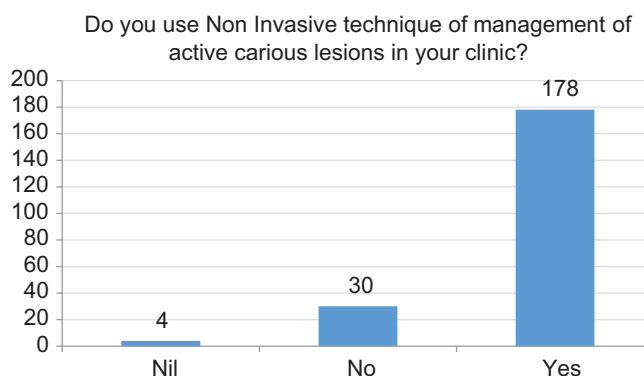
In this study, Table 1 shows region of clinical practice (percentage), table 2 shows the clinical experience of pedodontist in years (percentage), table 3 shows the Socioeconomic strata (Percentage). Maximum pedodontist were from the North India and had the clinical experience of 1-5 years.

**Regarding use of noninvasive technique of management of active carious lesions in clinic:** 83.96% pedodontists responded yes, 14.1% responded that they don't use noninvasive techniques in their clinic and 1.88% pedodontists didn't responded (Figure 1).

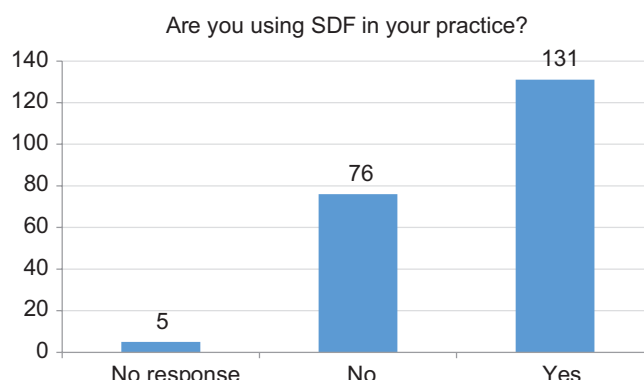
**Regarding use of SDF for the management of active carious lesion:** 61.79% responded that they use SDF in their clinical practice. 35.84% pedodontists not using SDF in their practice (Figure 2).

**Regarding percentage of active carious lesion treated with SDF application:** Out of 131 pedodontists 44.27% answered <25% per week, 41.98% answered 50-25% per week and 12.21% answered 75 – 50% (Figure 3).

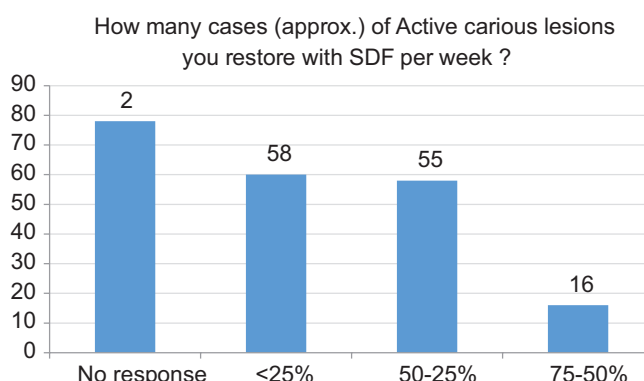
**Regarding protocol with maximum efficacy as per their experience:** Out of 131, 40.45% answered SDF application,



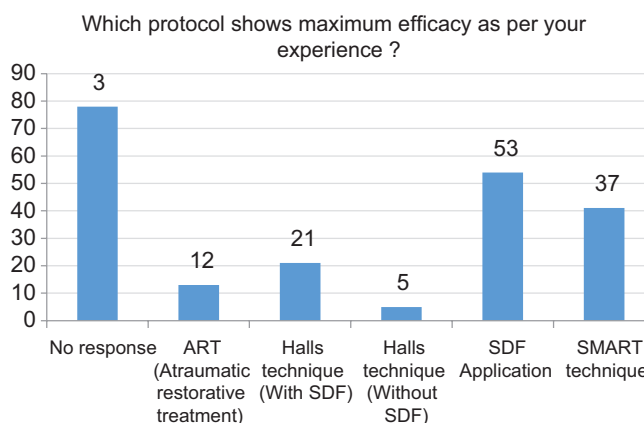
**Figure-1:** Regarding use of noninvasive technique of management of active carious lesions in clinic



**Figure-2:** Regarding use of SDF for the management of active carious lesion



**Figure-3:** Regarding percentage of active carious lesion treated with SDF application



**Figure-4:** Regarding protocol with maximum efficacy as per their experience

Region of clinical practice	N*= Number of Pediatric Dentists	Percentage(%)
North India	85	40%
West India	75	35.3%
South India	39	18.3%
Central India	6	2.83%
East India	7	3.3%

**Table-1:** Region of clinical practice (Percentage)

Clinical Experience (years)	N*= Number of Pediatric Dentists	Percentage(%)
<1 year	40	18.8%
1-5 year	103	48.5%
5-10 year	31	14.6%
>10 year	38	17.9%

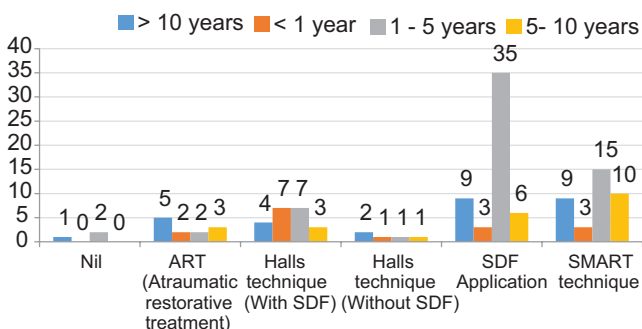
**Table02:** Clinical Experience in years (Percentage)

Socioeconomic strata	N*= Number of Pediatric Dentists	Percentage(%)
Urban	127	59.9%
Semi urban	64	30.18%
Rural	21	9.90%

**Table-3:** Socioeconomic strata (Percentage)

Which protocol shows maximum efficacy as per your experience?

\*How many years of clinical experience do you have (after completion of your post graduation degree)?



**Figure-5:** Regarding association between clinical experience and modality showing maximum efficacy as per clinical experience

28.24% answered SMART technique, 16.03% answered Halls technique (With SDF), 9.16% answered ART and 3.81% preferred Halls Technique (without SDF) as maximum efficacious. (Figure 4)

**Regarding association between clinical experience and modality showing maximum efficacy as per clinical experience:** There was a statistically significant / highly significant difference seen for the frequencies between the groups ( $p < 0.01, 0.05$ ) with higher frequencies of SDF Application with 1-5 years' experience (Figure 5).

## DISCUSSION

Regarding use of noninvasive technique of management of active carious lesions in clinic, majority of the pedodontists (83.96%) use noninvasive caries management techniques in private practice, 14.1% responded that they don't use and 1.88% pedodontists didn't respond. From these results it is certain that current choice of pedodontists is shifting more towards the minimal invasive approach of management of active carious lesion. Giacaman et al found preservation of tooth structure through the use of minimal invasive treatment for both non-cavitated and cavitated lesions is supported by strong evidence, which supports the paradigm shift towards routine use of more conservative strategies in the treatment of carious lesions.<sup>2</sup>

Regarding use of SDF for the management of active carious lesion. Majority of pedodontists (61.79%) responded that they use SDF in their clinical practice, 35.84% pedodontists not using SDF in their practice. Although reason could be unaesthetic appearance, inaccessibility of SDF in far located areas, high investment while purchasing or lack of awareness about the material. It is certain that SDF is choice of material now a days among pedodontists for management of active carious lesion. Nelson et al concluded that SDF can serve as an alternative, particularly for patients who cannot tolerate traditional dental treatment and can reduce the need for dental care to be performed under general anesthesia, with its associated health risks.<sup>3-6</sup>

Regarding percentage of active carious lesion treated with SDF application. Out of 131 pedodontists (using SDF), 41.98% answered 50-25% per week, 12.21% answered 75 –

50% and 44.27% answered <25% per week. Results shows SDF is material of choice among pedodontists now a days. Ericson et al concluded that SDF expresses a very precise excision of what has to be removed, without causing any damage to adjacent tissue.<sup>7</sup>

Regarding protocol with maximum efficacy as per their experience. Out of 131, 40.45% answered SDF application as maximum efficacious, 28.24% answered SMART technique, 16.03% answered Halls technique (With SDF), 9.16% answered ART and 3.81% preferred Halls Technique (without SDF) as maximum efficacious. Results shows clinicians believe SDF as most efficacious as per their practical experience. Chu et al found SDF is an alternative treatment for controlling dental caries when other approaches are not available.<sup>8,9</sup>

Regarding most common limitation for avoiding use of SDF. Among those using SDF (131 out of 212) as material of choice, most common reason for avoiding the SDF use, 87.78% (maximum) answered staining as the limitation, 4.58% answered high investment while purchasing, 3.05% answered metallic taste and 1.52% answered inaccessibility of SDF in their practice area.

MacLean J found that one consideration when deciding if SDF is appropriate is the agent's unaesthetic properties, as it will permanently stain caries lesions black. Treatment can be made more esthetic with traditional therapies or use of the silver modified atraumatic restorative technique at a later appointment.<sup>10</sup> Sara et al found Parental acceptance of SDF increased for primary compared to permanent teeth, on anterior compared to posterior teeth in both dentitions and for uncooperative children.<sup>11</sup>

Regarding association between clinical experience and modality showing maximum efficacy as per clinical experience. There was a statistically significant / highly significant difference seen for the frequencies between the groups ( $p < 0.01, 0.05$ ) with higher frequencies of SDF Application with 1-5 years' experience where pedodontists with 5 -10 years believe SMART as maximum efficacious followed by SDF application only. Hence, results can be interpreted as young pedodontists are considering SDF as efficacious as it is less time consuming and easy to manage with uncooperative child patients.

On the other hand, pedodontists with experience of 5 -10 years consider SMART as more effective as this technique is effective for patients who cannot report on second visit. Alvear et al 2016 concluded that Placement of SDF and GIC on the same appointment (SMART) is especially useful when, for whatever reason, the patient will not be able to return for subsequent dental treatment.<sup>12</sup>

Hence, the results of the study imply a shift of pedodontists from traditional approach of active caries management to minimal invasive approach of treatment. And Silver diamine fluoride (SDF) is most preferred material of choice especially in young uncooperative child patients followed by Silver modifies atraumatic restorative technique (SMART) among pedodontists across India.

## CONCLUSION

Through the results of the study, it can be concluded that current trend of caries management among pedodontists is shifting towards Silver diamine fluoride especially in young uncooperative patients. Thus more studies are encouraged to increase knowledge and awareness about its use and implications among pediatric dentists.

### Abbreviations

SDF - Silver Diamine fluoride

SMART - Silver modifies atraumatic restorative technique

GIC – Glass Ionomer Cement

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