Silver diamine fluoride for non-operative restorative treatment and prevention of dental caries

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ABSTRACT
Background: Dental caries is a multifactorial and dynamic disease leading to the demineralization and loss of tooth structure. Traditionally, this is treated with mechanical removal of carious tooth structure and restoring it with a restorative material, requiring specialized skills and equipment. Young children, patients with physical or intellectual disabilities, elderly patients, and patients living in remote communities are disproportionately affected because of greater difficulty accessing and undergoing operative dental procedures. The purpose of this narrative review is to explore the use of silver diamine fluoride as an alternative or adjunct tool in clinical practice for treating and preventing dental caries. **Method:** This review was conducted from July 2022 to May 2025 using 3 electronic databases; PubMed, Cochrane Library, and Ovid Medline. All types of literature were included except those not published in English. **Results:** Of the studies included in this review, positive results were found for silver diamine fluoride being an effective agent in treating cavitated and non cavitate lesions caused by dental caries. **Discussion and Conclusion:** With proper case selection and follow up, silver diamine fluoride is an effective agent for arresting dental caries. Its continual use by more clinicians because of its effectiveness, safety, low cost, and ease of use can help alleviate some of the challenges faced by certain patient populations. Further research should be done to assess its effectiveness on adult teeth as well as for dental caries prevention.

Keywords: access to care; caries prevention; caries risk; fluoride; restorative material; silver diamine fluoride

CDHA Research Agenda category: risk assessment and management

INTRODUCTION

Dental caries is the most prevalent health condition worldwide and most common disease among children, affecting approximately 2 billion people globally [1,2]. It occurs when bacteria in oral biofilm metabolize fermentable carbohydrates and produce acid, decreasing the pH at the interface of the tooth and causing demineralization of enamel and dentin [3,4]. A tooth is diagnosed as having dental caries at its first clinical or radiographic sign of demineralization. It can be categorized based on its severity and activity along the disease process, a non-cavitated lesion considered less severe, and a cavitated lesion being more severe [3]. Since there are stages that occur from the beginning of an acidic environment to the formation of a cavitated lesion where intervention can stop or reverse this process, prevention and early intervention are key components in caries management [1,5].

When the caries process begins, clinicians determine if it can be managed using a non-operative approach or will require operative intervention [5,6]. Non-operative at home management and prevention includes oral hygiene instructions, including the use of floss and fluoridated toothpaste, and diet counselling [7,8]. Professionally applied treatments include pit and fissure dental sealants and fluoride-based materials such as 5% sodium fluoride (NaF) varnish [9,10]. These are shown to increase the chances of remineralization and arresting lesions from progressing, and are the first line of treatment in preventing and managing non cavitated dental caries [11,12].

When dental caries develops into a cavitated lesion, the goal is to remove the caries while preserving pulp vitality and maintaining function of the tooth [13]. It is performed by selective or non-selective removal of carious tissue from the tooth followed by placement of a restorative material. This is the most common approach in treating cavitated lesions; however, this operative management is no longer recommended for every case and is difficult to achieve in certain patient populations [14,15].

There are multiple challenges to the provision of operative restorative treatment, particularly in young children, those with physical disabilities, and elderly patients. Providing restorative dental care for young children can present major behavioural challenges due to anxiety related to treatment. This may result in dental decay left untreated in many communities, and an increased risk of infection and pain. For young children with dental caries, treatment of all lesions at once under sedation or general anaesthesia is common practice, leading to long waitlists and delayed care. General anesthesia also poses risks to the patient. In addition, operative intervention alone does not reduce the caries risk of a patient, and children undergoing dental sedation or general anaesthesia often still suffer from dental decay post treatment [16].

Similarly, patients with physical or intellectual disabilities have been shown to have poor oral health and subsequently have a greater requirement for restorative treatment. Often, these patients require sedation or clinicians with specialized training in special needs patients, both of which can require longer wait times and travel [17,18].

Lastly, more elderly patients are requiring restorative treatment due to increased knowledge and awareness of oral hygiene practices allowing patients to maintain their teeth longer than in the past. They face challenges such as inability to sit in a dental chair due to mobility or cognitive difficulties and comorbidities [19]. As well, since prevalence of gingival recession increases with age, elderly patients have greater exposure of root surfaces to the oral environment [20,21]. Gingival recession along with elderly patients suffering from hyposalivation due to polypharmacy makes them more susceptible to root carious lesions that are sometimes too difficult to restore due to their size, need for isolation and location [22,23].

In addition to these patient challenges, many rural communities are not well equipped with the proper equipment necessary to safely provide treatment as a well-equipped operatory is expensive. This requirement is part of the reason untreated dental decay has become a public health issue, as access to care in certain communities is very difficult due to distance and cost, leading to poorer oral health outcomes [24,25].

A more recent factor is the difficulty with traditional restorative dental procedures brought on by the COVID-19 pandemic. To prevent the spread of aerosols and possibility of transmitting airborne pathogens such as SARS-CoV-2 to patients and staff, non-aerosol generating procedures have been emphasized in dental practices. As well, the postponement of non-urgent care in hospitals due to COVID-19 has created large backlogs and longer waitlists for patients requiring treatment under general anesthesia, leading to an amplification of untreated dental caries over the past few years [26,27].

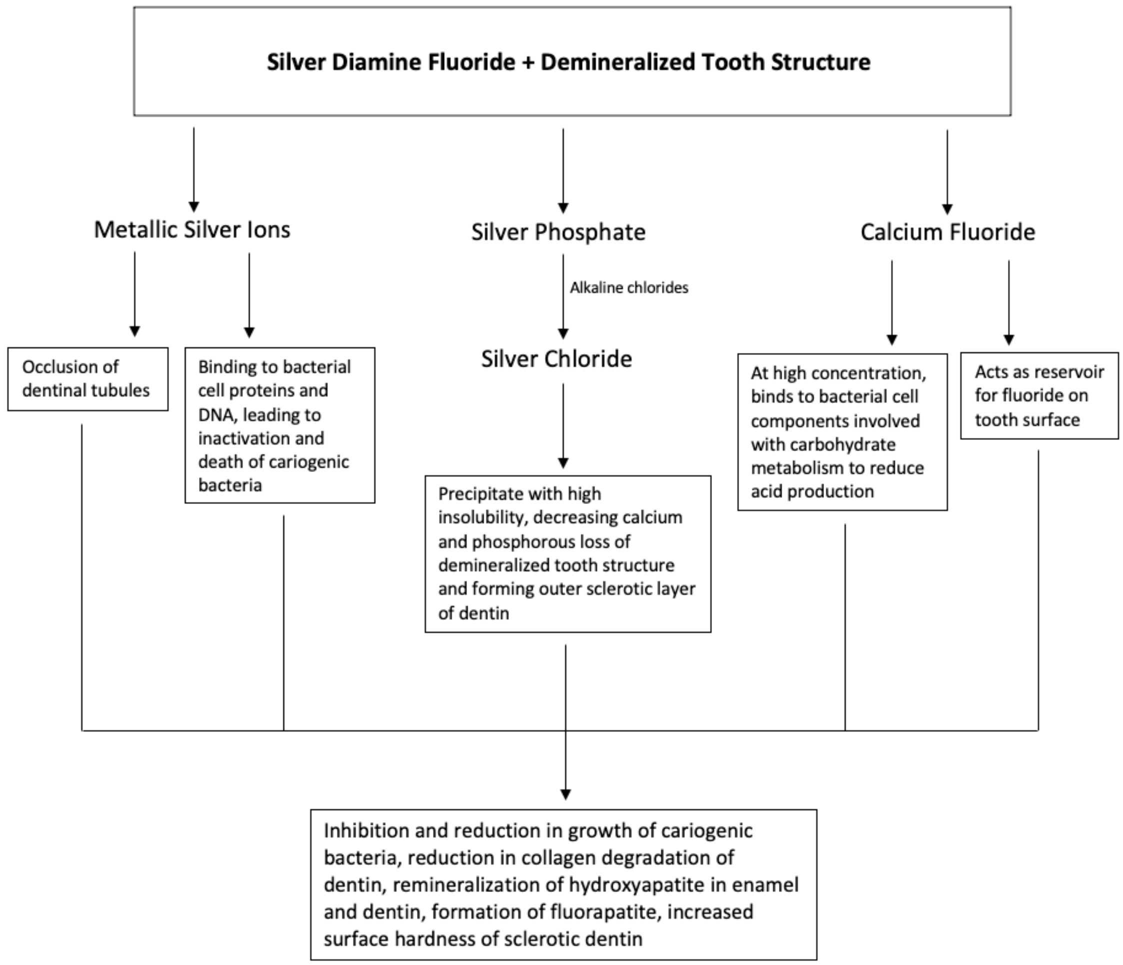
One potential solution to these challenges with access to care for traditional restorative treatment, is the growing interest in silver diamine fluoride because of its effectiveness in arresting caries while being an easy to use, non-aerosol generating procedure [35]. Silver diamine fluoride (SDF) (38%) is a colourless alkaline solution (pH 9-10) consisting of approximately 25% silver (253,900ppm), 4.48% fluoride (44,800ppm), 8% ammonia, and water. The ammonia allows for stabilization of the high concentration of silver and fluoride in the solution [28-31]. Thirty-eight percent (38%) SDF contains the highest amount of fluoride available for dental use and was approved by Health Canada in 2017 for use as an anti-caries agent on permanent and primary teeth [32-34]. An electronic survey of US pediatric residency directors in 2020, compared the results of SDF use with a similar survey sent in 2015. Interestingly, in 2015, only 26% of respondents reported use of SDF in their program, while 100% reporting its use in 2020 [36].

While the research is ongoing, there are proposed mechanisms of action for how SDF and its constituents arrest and prevent dental caries (Figure 1). When SDF is placed on demineralized tooth structure, it reacts with hydroxyapatite and leads to the formation and release of silver ions, calcium fluoride, and silver phosphate.

Silver phosphate and metallic silver ions occlude dentinal tubules and along with the formation of silver chloride precipitate, form an outer sclerotic dentin layer resistant to acid attack and progression of caries. The deposition of silver phosphate to the mineral contents of tooth structure is what causes the rehardening and resistance of the tooth structure to decay[37]. Silver also acts to kill and inhibit the growth of cariogenic bacteria [38]. This is because silver can bind to and disrupt bacterial membranes and cell walls and can be taken up by the bacterial cell transport system. When this occurs, silver ions bind to bacterial cell proteins and DNA, inactivating the enzymatic activity that ferments carbohydrates into acids preventing bacterial cell division and replication [26,29]. This mechanism allows the silver to prevent and arrest collagen degradation because of its ability to act on and inhibit matrix metalloproteinases and cysteine cathepsins, collagenases responsible for the degradation of demineralized dentin and progression of a carious lesion into deeper tooth structures [39-44].

The calcium fluoride formed by SDF application produces fluoride-like globules that are insoluble at a neutral pH in the mouth. They can remain on and within the tooth structure and act as a fluoride reservoir [45]. Once the pH is lowered by acid producing bacteria, fluoride is released from this reservoir, increasing the saturation of calcium and phosphate ions, and making the tooth surface more resistant to demineralization. Fluoride also helps form fluorapatite, a more resistant structure than hydroxyapatite to acid attack that can remineralize the tooth structure in demineralized areas. At high concentrations of fluoride such as in 38% SDF, fluoride has also been shown to inhibit bacterial enzyme metabolism, reducing the level of acid production and its penetration into the tooth [38,46].

Figure 1.



A more recent study examining the use of SDF for antifungal potential found it to be effective against oral Candida species. The understanding of its antifungal mechanism of action is limited and believed to occur due to the silver ions in SDF disrupting and binding to yeast cell walls [47]. This is important as a strong association has been found between severe early childhood caries and the presence of Candida albicans, an opportunistic fungal pathogen[48]. Therefore, the potential of SDF to target not only oral bacterial species but also oral fungal species can prove to be an effective application in treating severe early childhood caries. The aim of this literature review was to explore the use of silver diamine fluoride as an alternative or adjunct tool in clinical practice for treating and preventing dental caries.

METHODS

Relevant literature was searched using 3 online databases; PubMed, Cochrane Library, and Ovid Medline. The search was conducted between July 2022 and May 2025. The main search terms used were SDF, silver diamine fluoride, fluoride, access to care, caries risk, restorative material, and caries prevention. All relevant data from these articles were used including how SDF works, clinical applications, effectiveness vs other restorative agents, and toxicity. Broad inclusion criteria were applied as the research is still emerging on this topic, however papers published in a language other than English, and opinion articles on the use of SDF, were excluded.

RESULTS

Seventy-four sources were retrieved and analyzed in this review, all published in English between the years 2008 and 2025. The retrieved literature includes qualitative studies, case studies, randomized clinical trials, systematic reviews and meta-analyses. The results of the sources reviewed highlight the uses and effectiveness of SDF in clinical practice, as well as the precautions needed to be taken to deliver the best care for patients.

Indications and contraindications for SDF application

Silver diamine fluoride is generally considered a safe agent to use in both children and adults for arresting caries with few absolute and relative contraindications. The following are indications and contraindications for using 38% SDF to arrest and prevent caries. Table 1 includes patient specific factors, and table 2 includes tooth specific factors that must be considered prior to application.

Table 1. Patient-specific factors [30,49]

Indications	*Contraindications*
High caries risk patients (e.g. patients with xerostomia)	Silver allergy or intolerance to silver, fluoride, ammonia (absolute)
Uncooperative/precooperative children	Desquamative gingivitis or mucositis (relative)
Medically or behaviourally challenging patient	Patient unwilling to compromise esthetics
Patients with poor access to care/unable to see dentist often	

Table 2. Tooth-specific factors [19,30,50]

Indications	*Contraindications*
Active cavitated carious lesion	Caries encroaching on pulp
Asymptomatic	Symptomatic
Caries not encroaching on pulp	Signs of irreversible pulpitis or necrotic pulp
No signs of irreversible pulpitis or necrotic pulp	Signs of infection
No sign of infection	Presence of periapical pathology
No periapical pathology	
Removal of tooth structure would compromise tooth leading to extraction	
Difficult restorative access to tooth	

Adverse effects and toxicity

Major effects

Silver diamine fluoride has a high concentration of both silver and fluoride, bringing into question concerns about its safety and toxicity. One drop of 38% SDF (25 μL) contains approximately 1.12mg of fluoride and 6.34mg of silver and can treat approximately five tooth surfaces [51]. The average LD50 of 38% SDF tested was determined to be 520mg/kg by oral route, and 380mg/kg by subcutaneous route.

Using the subcutaneous route, which has a lower LD50, and a 10kg child, which assumed the smallest a child would be that presents with caries, Horst et al found a 400-fold safety margin. Based on these findings, they recommended a conservative daily maximum of 38% SDF to be 1 drop per 10kg [30]. Chen and colleagues used a mathematical model to predict the plasma and tissue concentrations of silver in a pediatric population based on animal and human models after accounting for developmental and physiological differences.[52] For a given dose of 38% SDF, they predicted the peak silver concentrations to be 5.2 to 1.3-fold higher (depending on age) compared to adults. The silver half-life was similar in all ages and tissue and plasma silver concentrations returned to baseline after 2 weeks. At the peak predicted silver concentrations, it was still much lower than toxic levels. They were able to demonstrate a pharmacokinetic model to study the safety of dental exposures in pediatric populations, and in this model, showed that 38% SDF application is well below toxic levels of silver in children [52]. The Environmental Protection Agency set the lifetime dose of silver exposure to 1 gram, greater than approximately 400 applications of one drop of SDF [53].

As well as exposure to silver, SDF poses an acute exposure to fluoride, raising concerns regarding fluorosis. However, currently there is no evidence that long term proper topical application of 38% SDF has not been shown to pose a significant risk for the development of fluorosis.[30] There is an ongoing trial in the United States with the FDA drug panel seeking approval of a maximum dose of 8 drops of 38% SDF per treatment visit on children as young as 12 months of age, however recommended doses in clinical practice cannot yet be made [54]. As with most dental materials, rigorous testing on safety is continually updated and as of 2022, it is important to note that to date, no studies indicating 38% SDF is toxic for the patient exist. No studies evaluating safety in a pregnant patient were found, so recommendations regarding its safety profile during pregnancy cannot be made.

Minor effects

While there have been no reports of acute toxicity from 38% SDF, minor side effects after application in both children and adults have been reported. These include gingival irritation, a metallic taste in the mouth and mild gingival erythema, all of which were reported to resolve after seven days [19]. Another clinical trial using SDF to treat caries in preschool children reported a prevalence of tooth and gingival pain in 6.6% of patients, gingival swelling in 2.8%, and gingival bleaching in 4.7% of patients, as reported by the participants' parents [55,56].

The most common adverse effect of 38% SDF is that it stains the carious lesions black[32,57]. This is because of the precipitate formed by silver which hardens the outer layer of the lesion. The main issue with this adverse effect is an esthetic one, and multiple studies have been done examining parental acceptance regarding their child's teeth turning black after caries arrest. Parental acceptance is found to be related to specific factors such as tooth location and child behaviour [58]. Acceptance of treatment with SDF was higher for posterior teeth than anterior teeth, and there was an increased acceptance level for children requiring more behavioural guidance, both of which still varied depending on the socioeconomic status of the parents. One third of parents found this treatment unacceptable under any condition, however interestingly, some of these parents would still approve of this treatment instead of their child needing to undergo sedation or general anaesthesia [59]. For those parents concerned with the black staining under any condition, it was more important to them that the SDF treatment arrested caries and minimized pain and sensitivity for their child [60]. There is ongoing research examining the effectiveness of potassium iodide in mitigating the black staining caused by SDF, which may lead to a greater acceptance and more widespread use in adults [57]. Because of the differing opinions and beliefs of each parent and patient, it is pivotal that there is informed consent with comprehensive communication about the risks and benefits prior to application of 38% SDF [56].

In addition to staining carious lesions, it should be noted that SDF will also stain soft tissue, operatory surfaces, clothing and other sites of contact. This necessitates great care in its use and handling.

Recommended clinical application

One of the main benefits of silver diamine fluoride for cavitated carious lesions is its ease of application because of few instruments being required. Caries removal prior to application is not necessary, therefore it requires no specific instrumentation. However, removal of gross debris or soft, necrotic dentin may be considered prior to application. To increase the success of the caries arrest, drying the lesion and good isolation is important [26,46]. The recommended time for application in the current literature varies from 10 seconds up to 3 minutes, while the American Academy of Pediatric Dentistry currently recommends 1 minute application time. However, in a recent trial evaluating effectiveness of different application times, the caries arrest rate did not vary significantly with different application times, so patients unable to tolerate longer application times will still benefit from the procedure [49]. As well, it is more effective for caries arrest to apply 38% SDF twice a year versus once [61].

Currently there is no one protocol with evidence of its effectiveness over another; the following is based on published literature for application recommendations [19,62].

1. Protect the lips with Vaseline or lip balm
2. Isolate the tooth with a rubber dam, gauze, or cotton rolls
3. Ensure the tooth is clean of any food debris and the carious lesion is dried
4. Apply 1 drop of SDF onto the carious lesion using a microbrush or cotton pellet (1 drop can treat approximately 5 decayed tooth surfaces)
5. Allow the SDF to soak into the carious lesion for approximately 60 seconds without rinsing or blowing with an air water syringe
6. Gently remove the excess SDF with a cotton roll or microbrush
7. Allow SDF to air dry for approximately 60 seconds

*note: for interproximal lesions, the following steps can replace steps 4-6

4. Insert woven floss or floss which has thicker, more absorbent sections between the teeth where the interproximal caries are located
5. Apply one drop of 38% SDF using a microbrush to the buccal, lingual, and occlusal parts of the floss until it is saturated
6. Allow the SDF soaked floss to soak in the carious lesion for approximately 60 seconds without rinsing or blowing with an air water syringe
7. Remove the floss and excess SDF with a cotton roll or microbrush

For patients who find the taste particularly objectionable, they may rinse with water or have a fluoride varnish applied following the SDF application procedure.

A summary of key findings is shown in Table 3.

Table 3. Summary of key findings

Authors, year of publication	Study Design	Population	Study Results
Raskin SE et al, 2021[1]	Naturalistic study	Medicaid patients ages 0-60yrs with at least 1 SDF application	- SDF alone had a 1 year survival rate of 76% - SDF alone had highest survival rate on primary canines and molars, and

			permanent premolars in patients 10-20yrs of age
Mitchell C et al, 2021[22]	Case series	Patients $\geq$ 55yrs with at least one active root caries lesion with SDF treatment repeated every 6 months	- At 18 month follow up, caries arrest rates were 91.6% on root surfaces and 89.8% around crown margins - Furcal lesions had a 100% arrest rate at 6 months
Ghorpade T et al, 2024[37]	Randomized control trial	45 children with young permanent first molars with SDF applied as indirect pulp therapy	- SDF and Type VII GIC can be as effective as $Ca(OH)_2$ when used for indirect pulp therapy - At 6 month and 12 month follow up, SDF stimulated a thicker dentin bridge formation than both $Ca(OH)_2$ and Type VII GIC
Mabangkhru S et al, 2020[66]	Randomized clinical trial	Children ages 1-3yrs with at least one active dentin carious lesion has SDF or NaF applied every 6 months	- After 12 months, the 38% SDF group had a caries arrest rate of 35.7% while thee 5% NaF group had a caries arrest rate of 20.9% - The SDF group had no negative impact on parental satisfaction with the appearance after treatment
Cleary J et al, 2022[67]	Randomize clinical trial	Children ages 2-10yrs with at least 1 soft cavitated lesion with no pain had either 38% SDF biannually or restorative treatment	- At 12 months, there were significantly more failures in the SDF treated group than the restorative treatment group - 57% of SDF treated lesions were hard at 6 months and 74% of SDF treated lesions were hard at 12 months
Zaghloul MAA et al, 2025[72]	Randomized clinical trial	Patients ages 9-14yrs with vital, deeply carious permanent mandibular first molars had either SDF or MTA as an indirect pulp cap	- At 12 month follow up, there was no statistical significance in dentin bridge formation between the SDF and MTA groups - After 12 months, both SDF and MTA groups had a 100% clinical success rate
Phonghanyudh A, 2022[74]	Randomized clinical trial	Children ages 1-3yrs with at least 1 enamel caries tooth were given either 38% SDF or 5% NaF	- Caries arrest rates after 18 months in the SDF group was 59.1% and in the NaF group was 58.8% - No significant difference were found between the two groups in arresting enamel caries

DISCUSSION

After analysis of the findings, SDF appears to be a safe and effective method for arresting and preventing caries in patients and is a great tool for the dental practitioner in providing high quality care to both high risk and low risk populations.

Primary teeth caries

Overall, 38% SDF has been found to be a very effective agent in arresting cavitated lesions in primary teeth [63]. For children with better plaque control and a lower caries risk, SDF was also found to be effective in arresting interproximal carious lesions using a similar application technique described above with woven floss [64]. The approved formulation for use in Canada is 38% SDF because of its effectiveness of those concentrations of silver and fluoride. Fung et al found that 38% SDF was more effective than 12% SDF for arresting caries in primary teeth, and increasing the application from once to twice per year increased the caries arrest rate. They concluded that one application per year is an effective strategy for patients with better plaque control. Consistent with other studies, they also found best results in arresting caries when SDF is used on smooth surfaces of anterior teeth [24,26]. Other studies have found that in larger lesions and lesions with heavy plaque, there is a lower likelihood of caries arrest after SDF application. Thus, it was suggested that children with poor oral hygiene and heavier plaque accumulation could have greater benefit from SDF application twice per year [19,65]. When comparing it with other non-operative preventive agents, 38% SDF has been found to be significantly more effective in arresting dentin caries in young children than 5% NaF [66]. Conversely, in a recent 12-month randomized controlled clinical trial, findings revealed that after 38% SDF application at 6-month intervals, there were more failures than restoratively treated teeth. The authors concluded that in high caries risk patients, their carious teeth need to be closely monitored for arrest if 38% SDF is applied [67].

Another way of measuring the effectiveness of treating caries is by looking at the reduction in pain after its application. In a recent study, 38% SDF was found to reduce pain and discomfort when applied to an active carious lesion [68]. Thomas et al assessed whether SDF application can reduce the amount of emergency visits, noting that in the wait period between referral and treatment time for sedation or general anaesthesia, there are emergency visits by these patients because of pain or infection from their untreated dental caries. The study treated 97 patients with SDF and compared it with 216 patients that were waitlisted before SDF was introduced. The incidence of dental emergencies was approximately 80% lower in the group of patients treated with SDF than those that were not. As well, 81% of the caries treated were arrested at follow-up [69]. A similar study from Australia found that over a 6-month period, there was an 88% reduction in referrals for general anaesthesia in children who received 38% SDF application because they were unable to tolerate in-clinic restorative treatment. The authors concluded that a preventive protocol for high caries risk patients using 38% SDF in conjunction with other preventive tools can avoid the need to require general anesthesia for treatment [70]. These studies show the potential SDF has in reducing pain for patients waiting for access to see a dentist to perform treatment with sedation or general anaesthesia.

Root caries

A limited number of trials have explored the effectiveness of 38% SDF for root caries arrest, however the available studies provide promising results. A review examining three randomized controlled trials found its use for both root caries prevention and arrest to be an effective option when treating root carious lesions as well as reducing dentin hypersensitivity [71]. A prospective case series found SDF to be an effective option for caries arrest at root surfaces, furcations, and crown margins. Patients in this case series had a mean age of 78.4 years and took an average of 3.6 prescribed medications. SDF offered a viable alternative for these elderly patients with a high caries risk, the ability to maintain their oral function and quality of life in their later years [22].

Permanent teeth caries

Most studies on the effectiveness of 38% SDF have focused on children and elderly patients, however a recent study[1] examined the effectiveness of SDF among the general population in a community dental care setting. In this study, although the majority of patients receiving 38% SDF were between the ages 1-

20 years, the age range was from 1 to 64 years. SDF was also delivered more commonly to patients at a high caries risk. The overall survival rate of SDF was 76% and showed to have a higher-than-average survival rate on permanent molars and premolars (survival rate in this study being defined as the patient returning 6 months or later with the SDF applied tooth not being restored or extracted). This study demonstrates that SDF can be a therapeutic tool for caries management in the general dental practice setting, as it's shown to be effective on permanent teeth as well as primary teeth, with patients of differing ages and caries risks [1]. A randomized controlled clinical trial evaluating the success of different indirect pulp therapies on young permanent molars found 38% SDF to perform better than both Type VII GIC and $Ca(OH)_2$. The study examined the dentin thickness at 6 and 12 month follow ups and found SDF provided increased dentin bridge formation compared to $Ca(OH)_2$ and Type VII GIC, concluding that SDF is an effective indirect pulp therapy on young permanent teeth [37]. Another randomized clinical trial compared the effectiveness of MTA (mineral trioxide aggregate) with 38% SDF in IPC (indirect pulp capping) on young permanent molars. Currently MTA is considered the gold standard for IPC, however its drawbacks include a high cost and difficulty in manipulation. After a one year follow up on the first molars, this study found no statistical difference in success rate of using SDF versus MTA in indirect pulp capping, as determined by having healthy pulp tissue after one year [72].

Caries prevention

When examining the rates of new carious lesions between 1 and 3 years after initial SDF application, studies have found SDF resulted in a 58% (+/- 22%) decrease in new carious lesions compared to no treatment and controls [16]. Treatment protocols varied, making it difficult to compare data from systematic reviews, however in limited available trials it was found that SDF decreased the development of carious lesions into dentin in both treated and untreated primary teeth. A systematic review examining the most effective professionally applied topical fluoride agent concluded that an annual application of 38% SDF with oral hygiene instructions was the most effective method in preventing dental root caries, performing better than 5% sodium fluoride varnish and 1.23% acidulated phosphate fluoride gel [73]. However, a randomized clinical trial examining the difference in effectiveness of 5% NaF and 38% SDF found similar treatment effects on arresting the progression of enamel caries, suggesting that 5% NaF may be the preferable option for children with only enamel caries to avoid the black staining of 38% SDF. The authors concluded that further studies would be required to assess its effectiveness on enamel caries in other age groups such as adults.[74]. The current studies demonstrate that not only is 38% SDF shown to be effective as a therapeutic agent, but there is some evidence showing it may be an effective preventive treatment before the disease process begins.

Limitations

This review had a few limitations. One of the main limitations is that having broad inclusion criteria introduced a wide variability in how clinicians used and applied silver diamine fluoride in their studies. The absence of the same structured approach to applying 38% SDF to each patient may have provided differing results depending on the clinicians. Another limitation of this review is that most studies are based on the results of 38% SDF in children. Since most behavioural issues in the dental settings occur in children, 38% SDF has primarily been used as tool for caries arrest in this patient population on primary teeth [1]. To advance the literature for 38% SDF, future studies should include its effectiveness on fully developed permanent teeth. As the patient population continues to age, more research on the use of 38% SDF in adults and the elderly would provide useful information on treating carious lesions in often difficult locations with difficult access [71].

CONCLUSION

The available literature on silver diamine fluoride shows that it has a growing place in dentistry as a cariostatic and preventive agent and is continuously being added to the armamentarium of more general dentists in their daily practice. SDF has been shown to be an excellent alternative to operative treatment for high-risk patients and those patients with barriers to care. Like conventional restorative treatment, SDF is most effective in combination with a proper caries risk assessment and preventive management plan, however, regular monitoring is still necessary to ensure the caries remain arrested. The upward trend in increased use and adoption of SDF shows a shift in thinking from traditional treatment to a minimally invasive non-operative approach that is more accessible and affordable, widening the ability to reach patient populations currently facing barriers in accessing oral health care.

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