

Acceptability of Silver Diamine Fluoride

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Abstract:

Background:

Silver diamine fluoride (SDF) can be used for active carious lesions in primary teeth and can be applied in dental clinics, in school, or in community-based settings with simple armamentarium and minimal support. Silver diamine fluoride causes darkening of carious enamel and dentin after its application.

Method:

An electronic literature search in Web of Science, Scopus, Science Direct, PubMed, Google Scholar, African Journal Online, Researchgate, and Google was done in June 2023. Search terms and keywords were combined by Boolean operators. Four independent investigators (research assistants) screened titles, abstracts, and full text of publications. The inclusion criteria were original research articles (human studies) carried out in African regions and including observational studies (cohort, case-control, cross-sectional), experimental studies (clinical trials, randomized or not) designs, case reports, and case series investigating parents, caregivers, guardians or children acceptability or acceptance of silver diamine fluoride treatment procedure and post-treatment blackening/staining of teeth. Systematic reviews and review articles were excluded.

Results:

One article was included as it was assessed to meet the aim of the review. It was a hospital-based study. Parental acceptance of silver diamine fluoride treatment with its black staining was assessed using the Likert scale. Acceptance of post-treatment staining of teeth among parents was higher in posterior teeth than in anterior teeth.

Conclusion:

Only one study on the acceptability or acceptance of silver diamine fluoride treatment procedure and post-treatment staining of teeth was identified among African parents. More studies from the diverse ethnic population in Africa will contribute to the existing literature.

Keywords: Africa, Acceptance, Children, Parents, Silver diamine fluoride

Introduction:

Silver diamine fluoride (SDF) is a clear odourless alkaline solution with different concentrations¹ like 10% SDF 12% SDF, 30% SDF, and 38% SDF.¹⁻² Silver diamine fluoride 38% contains high concentrations of fluoride¹ (44,800 ppm) and silver¹ (253,870 ppm) with an amine link, which act synergistically to arrest active carious lesions through different mechanisms.²⁻³ One drop of silver diamine fluoride [SDF, Ag(NH₃)₂F] contains 2.24 mg of fluoride and can be applied in dental clinics or in school or community-based settings with simple armamentarium and minimal support. One drop [SDF, Ag(NH₃)₂F] can be used for five actively carious teeth. Silver diamine fluoride treatment procedure has various indications^{2,4} in

Paediatric dentistry, and it involves the placement of a drop of the solution in a dental dappen dish, isolating using cotton wool or gauze, and then applying a small amount on the dried tooth/teeth surfaces with a disposable micro brush or applicator. The treatment procedure has increasing application³ and acceptance in some countries as it is simple, non-aerosol-generating, painless, non-technique sensitive, and can be done in resource-poor settings with minimal training.² Silver diamine fluoride causes dark discoloration of carious enamel and dentin, and it is contra-indicated in patients with silver allergy and ulceration of oral soft tissue and gingiva.² Oral health practitioners like Dentists may have concerns about the dark staining⁵ of teeth after its use and it may affect its

recommendation as treatment options to patients. Parents, caregivers, or guardians are a primary part of the decision-making process toward dental treatment for children. There are various ethnic groups with various cultures, socio-cultural beliefs, and practices in Africa. The aim of this article is to review the available studies on the acceptability or acceptance of silver diamine fluoride treatment technique and post-treatment staining of teeth, among parents, caregivers, guardians, and children in Africa.

Literature Search Method:

An electronic literature search in PubMed, Web of Science, Scopus, Researchgate, Science Direct, Google Scholar, African Journal Online, and Google was done in June 2023. The keywords used were silver diamine fluoride, acceptance, silver fluoride diamine, acceptability, diamine silver fluoride, African countries, parents, guardian, caregiver, African region, parental acceptance, African continent, parental acceptability, African parents, African children, and Africa. Search terms and keywords were combined by Boolean operators. Four independent investigators (research assistants) screened titles and abstracts of publications on the acceptability or acceptance of silver diamine fluoride treatment and post-treatment staining studies, and potential references to identify which studies met the inclusion criteria of this review. Information was extracted from the abstracts and full texts of articles regarding the location of the research and study objectives. The inclusion criteria were original research (human studies) carried out in African region and including observational studies (cohort, case-control, cross-sectional), experimental studies (clinical trials, randomized or not) designs, case reports, and case series investigating parents, caregivers, guardians or children acceptability or acceptance of silver diamine fluoride treatment procedure and post-treatment blackening/staining of teeth, and in electronic databases. Systematic reviews, literature review articles, viewpoints, books, letters, editorials, book chapters, perspectives, and news related to the acceptability or acceptance of silver diamine fluoride treatment procedure and post-treatment staining of teeth among African parents, caregivers, guardians, or children were excluded. Study data of the included articles were extracted and collated in a table, including study details (author(s), year of publication, study

location or country, study design, study objective, study population, and study conclusion). All identified studies in Africa were included and if relevant data were missing, the authors of the articles were contacted for additional information via e-mail. No specified time frame was used during the search; studies available in more than one electronic database were considered only once, and the published language was restricted to English. Any additional studies in the African region identified from the reference lists of published papers were retrieved from the web using Google Scholar and Google search engines.

Results:

Sixty-three articles were identified, forty-two duplicates were removed during screening. Abstract and full text were screened using inclusion criteria by four independent research assistants. Twenty articles were excluded. One article was included as it was assessed to meet the aim of the review.

The study identified was a self-controlled clinical trial with the objective of evaluating parental acceptance of silver diamine fluoride treatment with its black staining. It was a hospital-based study, and parental acceptance of silver diamine fluoride treatment with its black staining was assessed using the Likert scale. Acceptability or acceptance of silver diamine fluoride post-treatment staining of carious teeth among parents was higher in posterior teeth than anterior teeth.

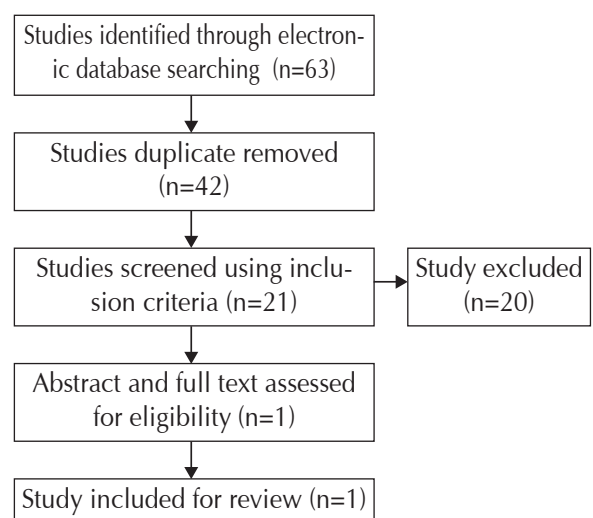


Figure 1: Flowchart of articles process

Table-I: Summary of identified studies on acceptability or acceptance of silver diamine fluoride treatment procedure and post-treatment staining of teeth in African region

S/N	Author/Year of publication	Study objective	Study design	Study population	Country of study	Study conclusion
1	Bassam ⁵ et al,2022	To evaluate parental acceptance of silver diamine fluoride treatment with its black staining.	Self-controlled clinical trial	3-7 years old children and their parents	Egypt	Acceptance of silver diamine fluoride post-treatment staining of teeth among parents was higher in posterior teeth than anterior teeth.

Discussion:

The traditional management of symptomatic, active carious lesion can be challenging in some young un-co-operative children. Active carious lesion can lead to loss of school hours among children.⁷ Silver diamine fluoride therapy can be a minimal intervention⁵ for unco-operative² children with active untreated carious teeth. It is not available in most Africa countries^{1,5}. Dentists, parents, caregivers, guardians and children may have concerns of the dark staining⁵ of teeth after its application to carious teeth. The armamentarium for silver diamine fluoride application is simple⁵ and non- technique sensitive. This review with its aim identified only one study on acceptability or acceptance of silver diamine fluoride treatment procedure and post-treatment staining of teeth among African parents. Most of the parents in the study agreed to silver diamine fluoride treatment procedure even though it stains teeth dark to avoid more advanced behavioural management techniques⁶ like conscious sedation and general anaesthesia.

Africa has 54 countries. More studies from various countries and ethnic groups in Africa will fill the knowledge gaps and will guide recommendations and clinical practice guidelines on the use of silver diamine fluoride for untreated carious lesion in primary teeth of African children.

Conclusion:

Only one study on acceptability or acceptance of silver diamine fluoride treatment procedure and post-treatment staining of teeth was identified among African parents. More studies from the diverse ethnic population in Africa will contribute to the existing literature.

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Conflicts of interest

There are no conflicts of interest.

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