

# Silver diamine fluoride to control severe early childhood caries in a child with epilepsy: a case report

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• **Conflicts of interest:** none declared.

## ABSTRACT

**Objective:** silver diamine fluoride (SDF) is a safe, effective and painless product to control dental caries. As it requests short-time appointments, its use in epileptic patients can reduce the risk of seizures. **Case Report:** a two-year old female patient with severe early childhood caries involving six primary incisors was referred to the University Clinic. Her medical history revealed the presence of cerebral palsy and epilepsy with daily medicines usage to control the disease. Due to the lower age of the patient, the risk of seizures during an invasive and time-consuming dental treatment, and avoiding general anesthesia, SDF 30% was chosen to arrest the caries lesions. A quality of life questionnaire (B-ECOHIS) was applied before and after treatment. **Conclusion:** the treatment with SDF was effective in arresting dental caries in a young epileptic child, without change in her quality of life.

**Keywords:** Epilepsy; Cerebral Palsy; Dental Caries; Cariostatic Agents; Child, Preschool

## Introduction

Cerebral palsy (CP) represents a group of permanent, nonprogressive disorders that affect the development of movement and posture, thus limiting the activity of individuals with this comorbid.<sup>1</sup> Epilepsy is a common chronic neurologic disorder that is characterized by recurrent unprovoked seizures. Because CP is a nonprogressive pathology in immature brains, and it is associated with scarring, some form of brain abnormality, seizures, or epilepsy disorders.<sup>1</sup> Depend on the severity and the motor deficit of cerebral palsy (CP), epilepsy can occur in 15% to 55% of the cases.<sup>2</sup>

Stress and fatigue are factors that can trigger seizure; thus, in patients with non-controlled seizure disorder and those with developmental disabilities, dental care becomes difficult.<sup>2</sup> Therefore, minimally invasive dentistry should be considered, rather than general anesthesia as a treatment option in case of severe early childhood caries (S-ECC) in patients with special needs. In this perspective silver diamine fluoride (SDF) is an alternative due to its characteristics as a topical, simple and fast medication to be applied, with substantial benefit in arresting dental caries.<sup>3</sup> We report a case of dental caries management with SDF in a child with cerebral palsy and epilepsy.

## Case Report

A 2-year-old female infant was referred to the Dental Clinic of UFRJ, Brazil, because of caries lesions in her primary incisors. Her medical history revealed the pres-

ence of cerebral palsy and epilepsy. She uses carbamazepine and valproic acid 3 times a day; however, the child still has few episodes of seizures. The medical history of the child was non-contributory. There was no report of pain, trauma, but the mother reported that the incisors fractured just after erupt as the child grinded her teeth during epileptic crises. The clinical oral examination revealed anterior open bite; S-ECC with dentin carious lesions in primary upper and lower incisors (51, 52, 61, 62, 81, 71) (Figure 1); with abundant biofilm and signs of gingival inflammation and hyperplasia. The mother was instructed about oral hygiene and dietary habits. Radiographic examination showed normal bone tissue and no signs of pulp involvement (Figure 2). The doctor confirmed the diagnosis of cerebral palsy and epilepsy and requested very short dental sessions to avoid seizures. Given the patient's minimal ability to cooperate, we opted to treat the dentin caries lesions with SDF 30% (Cariostop, Biodinamica, Brazil) to avoid caries progress. After cleaning the teeth with a tooth brushing, protect face skin and gums with petroleum jelly to avoid staining, isolate tongue and cheek with cotton rolls, and dry affected teeth; SDF was directly applied with a micro sponge onto affected teeth surface for 3 minutes. The excess was removed with cotton balls and then rinsed with water and simultaneously saliva ejector suction. A quality of life questionnaire (B-ECOHIS)<sup>4</sup> was applied before clinical intervention (initial total score = 2) to evaluate if the treatment would affect the child and family's quality of life.

The questionnaire was applied in the form of an interview by the main researcher, with the mother. The B-ECOHIS refers the quality of life of the child and the family, as it has 2 sections: (1) Child Impact Section (CIS); and (2) Family Impact Section (FIS).<sup>4</sup> The mother reported no adverse effects after 2 days of the treatment. One-month follow-up (Figure 3) showed a better oral hygiene and we reinforced feeding instructions with the mother, who was engaged with the treatment. B-ECOHIS was applied again, three months after the treatment, when there was no report of pain; the result was the same: total score = 2.



**Figure 1.** Intraoral photography showing caries lesions in the upper and lower incisors.



**Figure 2.** Periapical radiograph of superior incisor with caries lesions.



**Figure 3.** The upper and lower incisors after one-month SDF (Silver Diamine Fluoride) application.

## Discussion

The consequences of S-ECC often include: an increased risk of new carious lesions, hospitalizations and emergency room visits, increase of treatment cost, loss of school days, and a negative impact of oral health-related quality of life. Thus, it is essential to implement an efficient treatment. As the child is very young and has episodes of seizures, despite the medication, we planned a short time-consuming, low-cost, simple and less risky dental treatment using SDF to arrest dental caries until aesthetics treatment will be possible.

Another alternative should be atraumatic restorative treatment, but in this case, manual excavation of infected dentin would be necessary, which would increase the time of appointment and discomfort. Otherwise, treatment of non-symptomatic caries with SDF becomes an option for some cases as uncooperative behavior that would be indicated for general anesthesia.<sup>3</sup> Considering pediatric patients, SDF provides high rates of caries arrestment for buccal or lingual smooth surfaces of anterior teeth.<sup>3</sup> In the present case, the incisors were treated with SDF and the success was achieved, since the lesions were arrested. A semi-annual SDF application will be done for sustaining effects,<sup>3</sup> until the final restorative treatment be implemented.

Dental caries has a multifactor etiology and is associated with bacterial plaque (biofilm), frequent sugar intake, malnutrition, high rates of infection in early life, socioeconomic factors<sup>5</sup> and also developmental defects of enamel (DDE).<sup>6</sup> In the present case, it is important to emphasize that the location of the caries lesions in the incisal margin and the initial appearance of the injuries in the lower incisors suggests that there was an enamel defect that also contributed to the development of caries lesions.

Comparing B-ECOHIS scores we can observe that although SDF has disadvantages as tooth darkening and does not restore the shape and function, it did not affect the quality of life of the child and her family. Probably because the mother accepted the treatment and was relieved with the problem's solution, added to the fact that there were no reports of pain. Crystal *et al.* (2017) affirmed that parents of children with behavioral or medical limitations are willing to accept SDF treatment, mainly because they prefer an outpatient service than general anesthesia.<sup>7</sup> In addition, SDF do not affect the bonding strength of composite resin to dentin,<sup>8</sup> thus, it will not interfere with the success of the restorative treatment in the future.

SDF is an effective treatment to arrest dental caries in young epileptic children and does not prevent esthetic options, allowing the final treatment to be extended until the child becomes more conditioned to the treatment's acceptance.

## Conclusion

The treatment with SDF was effective in arresting dental caries in a young epileptic child, without change in her quality of life. Thus, we can conclude that this clinical report is important for pediatric dentists by: Epileptic patients are usually treated with anticonvulsant medications, which can increase the risk of caries; stress and anxiety in dental offices may increase the risk of seizures in patients with epilepsy, which requires a short-term treatment; SFD

is a minimally invasive, safe, effective, efficient, simple and short-term treatment, thus, pediatric dentists should consider this child-friendly option to control dental caries in young epileptic children.

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## Mini Curriculum and Author's Contribution

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