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Original Article

Effect of CPP-ACP Application and Restoration of Primary Teeth on Salivary Mutan Streptococcus in Children with Early Childhood Caries

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***ABSTRACT*:**

Background: Dental caries is a preventable disease, it can be stopped and even potentially reversed during its early stages.ECC is associated with individual, social and financial costs and significantly impacts a child's quality of life.Physicians must concentrate on using existing methods to detect signs of early and advanced caries and provide advice on how to prevent and control caries in their patients. The aim of this study to evaluate the effectiveness of CCP-ACP application on restored tooth of ECC patient. **Material & Methods:** A randomized control trial methodology was used to randomly divide the participants into two equal groups of 30 in each group.All the decayed teeth present were restored with restorative glass ionomer cement following the proper isolation and manufacturer's instruction. A coating of varnish was applied prior to the initial set of the restoration. **Results:**Our study showed that the maximum number subjects (almost 70%) was 4 to 5 years of age & 35 subjects were male and 25 were females in both groups.The mean value of colony forming units in control group was 1.719±0.1609, 1.735±0.1893 in case group at baseline and does not significant (p=0.7344) in between groups. The mean value of CFU's in both group was 1.334±0.1678, 1.156±0.1742 at after treatment & changes of mean value was significant (p=0.0002***). **Conclusion:** The salivary mutans streptococci count significantly reduction in both groups after treatment with CPP-ACP containing paste. Dentists must focus on utilizing existing techniques to distinguish indications of right on time and propelled caries and give guidance on the best way to counteract and control caries in patients.

Key words: Dental caries, ECC, CCP-ACP application, CFU counts.

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INTRODUCTION:

The term "dental caries" is used to describe the results, signs, and symptoms of a localized chemical dissolution of the tooth surface caused by metabolic events taking place in the biofilms (dental plaque) that cover the affected area[1]. Children in the age range of 12–30 months have a special caries pattern that differs from that in older children. Caries affects the maxillary primary incisors and first primary molars in a way that reflects the pattern of eruption. The longer the tooth has been present and exposed to the caries challenge, the more it is affected. The upper incisors are most vulnerable, while the mandibular incisors are protected by the tongue and by saliva from submandibular and sublingual glands[1].

Dental caries is a preventable disease, it can be stopped and even potentially reversed during its early stages. People remain susceptible to the disease throughout their lives. Although the risks factors for early childhood caries (ECC) have been well documented in various populations. It remain a difficult condition to prevent. ECC is associated with individual, social and financial costs and significantly impacts a child's quality of life. In ECC children, the cariogenic bacteria colonized the newly erupted teeth and the frequent consumption of sugars leads to rapid demineralization and cavitation of the primary teeth.[2]

The prevalence of dental caries has reduced worldwide, yet that of ECC remains high and so it is currently a WHO concern.[3]The difference between ECC and the dental caries is that, here the progression of caries is very rapid and widespread; and because of this rapid progression, its prevention and management is a challenge. American Academy of Pediatric Dentistry (AAPD) defines early childhood caries (ECC) as the presence of one or more decayed (non cavitated or Cavitated), missing (due to caries), or filled tooth surface in any primary tooth in a child 71 months of age or younger. A variety of factors have been suggested to be associated with ECC. Biological factors such as the presence of high counts of Mutans streptococci (MS), as well as social/demographic/ behavioral factors.

The biology of the mouth may be modified by several factors unique to young children related to the immaturity of the host defense system, as well as behavioral patterns associated with feeding and oral hygiene in early childhood. It is believed that the condition is progressed and exacerbated by prolonged use of sweet drinks in a nursing bottle, particularly night feeding or during day naps.[4]

A study demonstrated that oral health training during residency can increase pediatrician confidence in participating in important oral health-promoting tasks, including anticipatory guidance, oral screenings, and oral health-risk assessments. Additionally, dentists need to establish the best ways to provide preventive and clinically effective care. Scientific advances must blur the demarcation between dental and medical practices; dental caries is a health problem that can be managed by a team of health care providers including dentists and physicians[5]. Physicians must concentrate on using existing methods to detect signs of early and advanced caries and provide advice on how to prevent and control caries in their patients. The aim of this study to evaluate the effectiveness of CCP-ACP application on restored tooth of ECC patient.

MATERIAL & METHODS:

Source of data: preschool children aged 3-5 years presenting to the regular OPD of department of Pedodontics was considered for the study based on following criteria:

Inclusion Criteria

1. Age group 3-5 years
2. Children willing to participate in the trial.
3. No history of medical disorders or hospitalization or antibiotic usage in last 3 months
4. Child having one or more carious teeth.
5. Children residing at a distance of within 10 kms of campus.

All the parents of the participants are trained with respect to the correct brushing technique for their child. New tooth brushes and a non-fluoridated tooth paste.

Restoration of decayed teeth

All the decayed teeth present were restored with restorative glass ionomer cement following the proper isolation and manufacturer's instruction. A coating of varnish was applied prior to the initial set of the restoration.

A randomized control trial methodology was used to randomly divide the participants into two equal groups of 30 in each group.

Group A: CPP-ACP group

The parents of the children are asked to apply a pea size of CPP-ACP cream on the surfaces of all teeth after dinner prior to sleep.

Group B : Control group

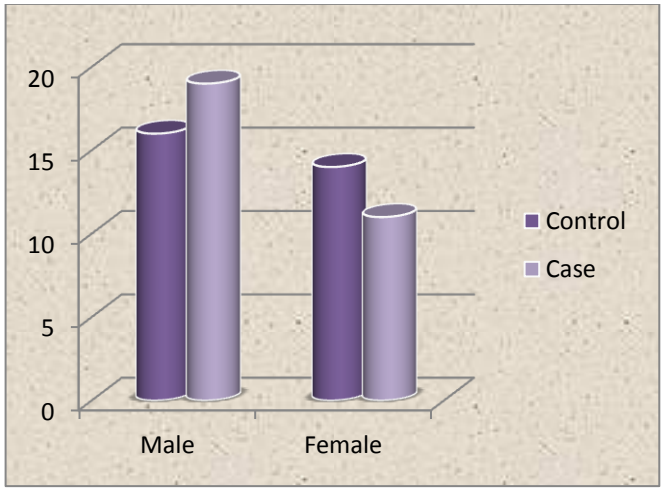
After 1 month, all the children are recalled and their saliva samples are again obtained to evaluate the number of salivary mutan streptococcus colony forming units.

The data obtained was entered in Microsoft Excel and subjected to statistical analysis to facilitate comparison between the groups.

RESULTS:

Our study showed that the maximum number subjects (almost 70%) was 4 to 5 years of age & 35 subjects were male and 25 were females in both groups (graph 1). The mostly children's have taken snack less than or equal to two times (85%) in a day after applying of paste in both groups (table 1).

The mean value of colony forming units in control group was 1.719±0.1609, 1.735±0.1893 in case group at baseline and does not significant (p=0.7344) in between groups. The mean value of CFU's in both group was 1.334±0.1678, 1.156±0.1742 at after treatment & changes of mean value was significant (p=0.0002***) (table 2).



Graph 1: Age wise distribution of gender in case and control group

Table 1: Distribution of case and control group according to snack taken

Snack taken	Control Group	Case Group
≤ 2	27 (90%)	24 (80%)
>2	3 (10%)	6 (20%)
Total	30 (100%)	30 (100%)

Table 2: Comparison of CFU count in case and control group

CFU count	Control Group	Case Group	T	P-value
Baseline	1.719±0.1609	1.735±0.1893	0.3409	0.7344 NS
After Treatment	1.334±0.1678	1.156±0.1742	4.014	0.0002***

DISCUSSION:

Early childhood caries is a public health problem that continues to affect infants and preschool children worldwide. Oral bacteria like, Streptococcus mutans and Lactobacillus spp. are the main microorganism implicated for the initiation and progression of caries respectively.

In our study showed that maximum number subjects (almost 70%) was 4 to 5 years of age. In developing countries, the prevalence of ECC differs according to the group examined, and a prevalence of up to 85% has been reported[6]. In the Western world, the prevalence at 3 years of age was 19.9%, and strong associations were found with socioeconomic status and ethnicity[7]. In a Japanese national survey in 2007, the experience of ECC was 2.8% among 18-month-old children and 25.9% among 3-year-old children[8]. It is believed that the condition is progressed and exacerbated by prolonged use of sweet drinks in a nursing bottle, particularly night feeding or during day naps.[4]

The present study observed that the 58.33% subjects were male and 41.60% were females in both groups. Majority of child's mother was educated higher secondary level (46.66%), followed by undergraduate (31.66%), primary (18.33%) and postgraduate only 3.33% in both groups. However, a cross-sectional study in Japan reported that dental caries in 3-year-old children was more strongly associated with child-rearing behaviors than mother-related factors, such as health insurance, health behaviors, and dental health status[9].

In our study reported that mostly children's have taken snack less than or equal to two times (85%) in a day after applying of paste in both groups. Children with ECC typically experience frequent and prolonged consumption of sugared beverages[10]. Moreover, an epidemiological study demonstrated that breast feeding and its duration were independently associated with an increased risk for ECC and a greater number of decayed or filled tooth surfaces among children aged 2–5 years in the United States[11]. However, it should also be noted that these children were living in poverty.

The present study showed the mean value of colony forming units in control group was 1.719±0.1609, 1.735±0.1893 in case group at baseline and does not significant (p=0.7344) in between groups. The mean value of CFU's in both group was 1.334±0.1678, 1.156±0.1742 at after treatment & changes of mean value was significant (p=0.0002***). Similar observation by Marggaret L et al (2013)[2] found that significantly fewer MS-positive children in the CPP-ACP group (26%) v/s the comparison group (47%). Another study done by ShilaEmamieh et al (2015)[12]found that statistically significant reduction of salivary S. mutans was displayed in both groups A (Chewing gum containing CPP-ACP) and B (Chewing gum containing xylitol) after the intervention when compared with baseline (P < 0.001), and group A shows more statistically significant reduction of salivary S. mutans than group B (P = 0.011).

Ruchi Vashisht et al (2013)[13] found that the mutans counts were decreased in the 3-month experimental period in both group but statistically not significant in baseline and after treatment, which were conflict our results.

CONCLUSION:

Our results suggested that the ECC most commonly occurred in 4 to 5 years of child age, low educated mother's child & less frequent intake of snacks. The salivary mutans streptococci count significantly reduction in both groups after treatment with CPP-ACP containing paste. Dentists must focus on utilizing existing techniques to distinguish indications of right on time and propelled caries and give guidance on the best way to counteract and control caries in patients.

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