

Effect of oral anticipatory guidance on oral health and oral hygiene practices in preschool children

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Thirty children (6 to 18 months), enrolled in a dental program since birth, make up the intervention group. Control group consisted of thirty children who were of similar age and gender but had never been to a dental office. The presence of visible dental plaque and the performance of oral hygiene differed statistically between both groups. The dental program was effective in reducing visible dental plaque, and in establishing oral health habits among parents and young children.

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INTRODUCTION

Preventive dental care for children has the objective to develop a healthy functioning dentition throughout life. It should be established in early childhood, since the prevalence of oral diseases is still high in some population groups, and can be associated with systemic conditions. In addition, preventive strategies provide suitable treatment options, resulting in cost reduction and better prognosis.¹⁻⁵

The most common form of periodontal disease in children is marginal gingivitis. Although its severity is substantially lower compared to adults, the condition tends to get worse as we get older. Furthermore, if childhood gingivitis could be related to the onset of adult periodontitis, it would have a great impact on prevention.⁶⁻¹¹

The literature about periodontal status in preschool children is scarce, and the prevalence rates of the disease may vary based on different methodologies. Nevertheless, some studies point to a general increase of gingivitis affecting young children and adolescents¹⁰⁻¹⁵ phenomena also seen in Brazil.¹⁶

The etiology of gingivitis in children, as in adults, is a result of a multifactorial process, dependent on the interaction of toxins from the bacterial dental plaque, immunological response, local and systemic factors, and socio economic level. In most children, gingivitis is seen as a color change in marginal and papillary gingiva, which becomes redish with a slight swelling. Creviceal tissues may also bleed upon probing.^{4,17}

Since the development of gingivitis is strongly correlated with the growth and maturation of bacterial colonies near or at the gingival crevice, the major preventive goal should be the control of plaque formation. Dental plaque is an indicator of periodontal and dental caries risk among children, and therefore, should be a key element in health education.^{4,18,19,20}

Multidisciplinary programs of continuous health education and systematic approaches, involving parents and children, have demonstrated their importance on the acquisition of dental health habits, and also on the motivation of self care to avoid dental caries and gingivitis.¹⁸⁻²² Besides, parents seem to be the major source of bacterial colonization in infants, and efforts should be done to prevent or delay the precocious establishment of pathogens in the child's oral cavity. The earlier the infection occurs, the greater the opportunity the microorganisms have to establish themselves in that ecological niche.^{11,23,25}

Preventing oral diseases requires critical decisions

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early in infancy regarding oral hygiene, feeding patterns, and fluoride supplementation. The dental examination, when performed during the first year of age, provides the child a pleasant introduction to the dentist, and allows the assessment of individual risk factors to develop oral diseases. It also offers the opportunity for counseling the parents, reinforcing preventive measures which can give birth to a generation with better health.

The objective of this study was to assess the effectiveness of oral anticipatory guidance on the gingival health in preschool children and determine its role on their oral hygiene practices.

METHODS

This study was conducted at the University of Brasilia Hospital, Brasilia, Brazil and was approved by the Ethics Committee of the Health Sciences Center. An informed consent was obtained from the parents of children participating in the study. The presence of erupted primary teeth and good general health status were required.

The cases comprised of children who had participated since birth in the infant dental program of the Pediatric Dentistry Baby Clinic, University of Brasilia Hospital. The infant dental program included both an educational as well as a clinical component and was provided once every three months. Oral anticipatory guidance consisted of counseling with regard to the pathogenesis of dental caries and gingival disease and the importance of oral hygiene and good dietary practices for dental prevention. At each visit the infant received an oral examination and cleansing of the oral cavity with gauze and water. Once the primary teeth had erupted, they were disclosed prior to cleansing with an age-appropriate toothbrush, or with gauze if there were only incisors present. Toothpaste was not used. Risk assessment was performed by means of a ques-

tionnaire with information on dietary and oral hygiene practices, medication use, fluoride exposure and socioeconomic status. Additional information for the risk assessment was derived from the clinical examination including the presence of dental anomalies, enamel hypoplasia, incipient caries lesions and visible dental plaque. Following risk assessment, the child's next dental visit was scheduled accordingly. Thirty children aged from 6 to 18 months were randomly drawn from this infant dental program to make up the intervention group for the present study (Group A).

The control group (Group B) consisted of thirty children who were of similar age and gender to those in the intervention group. These children were randomly drawn from the Medical Program of Growth and Development, University of Brasilia Hospital. The control children were not enrolled in any specific dental program, and by the time of this study, they had never been in a dental office or clinic.

For the present study, one investigator performed the oral examinations in both groups. The examination was conducted in a dental office with the patient laid down in a baby dental chair. A dental mirror, #3 explorer, and a WHO recommended periodontal probe were used during the oral examination.²⁶ The presence of visible dental plaque on the buccal and/or lingual surfaces of the teeth was determined visually without the use of a disclosing solution. If plaque was detected on two or more teeth, it was scored as positive for visible dental plaque.²⁷ However, in some children who had great amount of visible plaque it was decided to disclose in order to promote parents education (Figure 1). Positioning the periodontal probe in the gingival crevice at a depth of 1 mm and then passing it around the gingival collar of the tooth registered the presence/absence of gingival bleeding (Figure 2). The tooth was observed for 15 to 30 seconds following probing and was scored as being positive if gingival bleeding



Figure 1. Plaque disclosure in a 12-month-old child for parent's education purpose.



Figure 2 – Absence of gingival blending during probing.



Figure 3 – Teaching parents tooth brushing in a 12-month-old child.

occurred.²⁶ Periodontal probing was performed on all the teeth present. The presence of even one tooth with gingival bleeding led to the child being scored positive for this factor.

After the periodontal exam, the teeth were cleaned with a toothbrush, and the dental exam concluded (Figure 3). The parents of Group B children were invited to enroll their children in the Dental Program, where the children could be followed up and receive proper preventive and restorative treatment.

Statistical analysis

A series of hypothesis were assessed through chi-square tests, with a significance level of 0.001. Logistic regressions were employed with the presence of visible dental plaque or gingival bleeding as outcomes, and a series of other variables as predictors; the significant level was established at 0.01.

RESULTS

The presence of visible dental plaque differed between children of groups A and B ($p < 0.001$) and the data is presented in Figure 4.

The performance of oral hygiene and the beginning of this procedure is shown in Figure 5 and differed between groups ($p < 0.001$).

Table 1 – Daily oral hygiene among children

Daily periods of oral hygiene	Group A		Group B	
	%	N	%	N
After waking up	0	0	41.6	4
After lunch	0	0	8.3	1
After dinner	33.3	8	0	0
After waking up /dinner	20.8	5	33.3	5
After every main meal	41.6	10	0	0
No specific time	4.1	1	16.6	2
Total	100	24	100	12

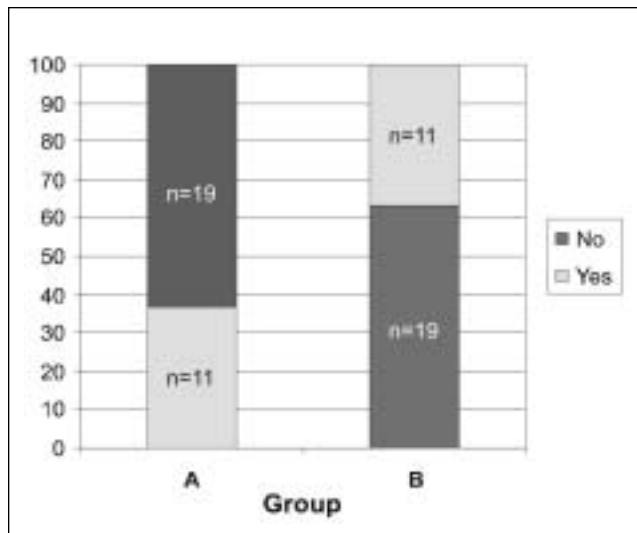


Figure 4. Presence or absence of visible dental plaque between Groups A and B.

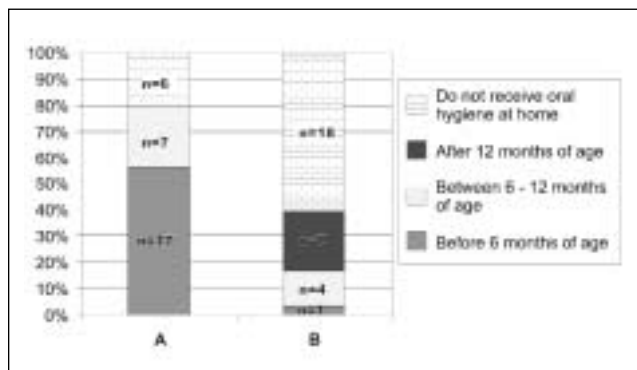


Figure 5. Relation between oral hygiene measures and the beginning of the procedure among children

The daily oral hygiene habits of children of both groups as reported by their mothers are presented in Table 1.

The relationship between the presence of visible dental plaque and oral hygiene procedures is presented on Table 2. The logistic regression applied to the presence of visible dental plaque as an outcome to oral hygiene procedures and group membership as predictors was not statistically significant (Likelihood Ratio = 5.0138, $p = 0.0815$).

The presence of visible dental plaque was not influenced by daily sugar intake and group membership

Table 2 – Relation between the presence of visible dental plaque and oral hygiene procedures among children.

Oral hygiene	Dental plaque [n (%)]			
	Group A		Group B	
	Presence	Absence	Presence	Absence
Yes	8 (27)	16 (53)	7 (23)	5 (17)
No	3 (10)	3 (10)	12 (40)	6 (20)

Table 3 - Daily sugar intake and presence of visible dental plaque among children

Daily sugar intake	Dental plaque [n (%)]			
	Group A		Group B	
	Presence	Absence	Presence	Absence
Until 5 times/day	8 (27)	17 (57)	7 (23)	6 (20)
More than 6 times/day	3 (10)	2 (7)	12 (40)	5 (17)

Table 4 - Gingival bleeding among children

Gingival bleeding	Dental plaque [n (%)]			
	Group A		Group B	
	Presence	Absence	Presence	Absence
Yes	0 (0)	0 (0)	3 (10)	0 (0)
No	11 (36.3)	19 (63.3)	16 (53.3)	11 (36.6)

(Likelihood Ratio = 5.3685, p= 0.0683). The data is presented in Table 3.

Gingival bleeding occurred in only 3 children and its relation to presence of visible dental plaque and group membership is presented in Table 4. Due to quasi-complete separation of data points, it was not possible to access the influence of the predictors on gingival bleeding.

DISCUSSION

The American Academy of Pediatric Dentistry recommends that a child visits the dentist “within six months of the eruption of the first primary tooth and no later than twelve months of age.”¹ This recommendation is intended to lay “the foundation on which a lifetime of preventive education and dental care can be built, in order to help insure optimal oral health into childhood.”¹ The sagacity of this recommendation is supported by the results of the present study where twice as many children benefited from the early intervention received oral hygiene measures at home compared to the control children.

In this investigation, 63.3% of the infants followed since birth by the Preventive Dental Program did not show visible dental plaque at the moment of the oral exam, contrasting to 36.6% of the children in Group B (Tables 1 and 4). These results are in accordance to previous studies, which have demonstrated that, regardless of age, children submitted to a preventive oral program have lower dental plaque index and less amount of visible dental plaque, compared to those who are not enrolled in any specific dental program.¹⁹⁻²²

The oral hygiene procedures are considered one of the greatest methods designed to remove bacterial plaque. They are important during the first year of life, not only to maintain a healthy environment, but also to establish a life long habit of daily oral care.^{1,10} As the

infants do not have the level of understanding to perform tooth brushing, the parents are totally responsible for that, and they should be advised to start this procedure as soon as the primary teeth begin to erupt.^{1,5}

The results of this study reveal that oral hygiene procedures are commonly performed on infants followed by a dental program, and these measures are usually started prior to the age of 12 months. Furthermore, it can be seen an inverse association between oral hygiene procedures and the presence of visible dental plaque. At the Baby Dental Clinic, the preventive program emphasizes regular follow-ups of children and communication with the parents about the etiology of oral diseases and their prevention. As a consequence, the parents have shown to perform oral hygiene procedures more frequently, and with a greater efficacy, resulting in better dental plaque control (Tables 1 and 2).

In contrast, parents whose children were not followed by a preventive dental program did not have the same health behaviors. In Group B, more children did not receive oral hygiene at home, and among those who did, several showed visible dental plaque (Table 2). It seems that the parents do not know about the importance of oral hygiene procedures during the first year of life, or they are not encouraged to perform these measures correctly. It should be stressed that, although a systematic Medical Program followed all children in Group B, they still did not show a satisfactory oral health status. These results suggest that pediatricians, physicians and public health authorities should include oral health education in their programs and daily activities, providing information to the parents and referring children for specific dental treatment whenever it is necessary.^{4,28,29}

Gingivitis is strongly correlated to the presence of dental plaque on tooth surfaces, but the presence of dental plaque does not necessarily imply presence of gingivitis. In the present study only 3 children belonging to Group B presented gingival bleeding, therefore it was not possible to state that the presence of visible plaque could develop gingivitis and children at this age (Table 4). This could be due to insufficient presence of specific microorganisms to initiate the inflammatory disease, the composition of dental plaque and to systemic factors that modulate the reaction of gingival tissues to the bacterial deposit and its toxins.^{2,6,8}

The gingival inflammation in young children is milder than in older children or adults with the similar amount of dental plaque, but despite that, the clinician must be aware to the risks that those young children have to develop advanced oral disease in subsequent ages.^{4,6,7} It is known that microorganisms associated with the onset and severity of adult periodontal disease, such as *A. actinomycetemcomitans*, *P. gingivalis* and *Capnocytophaga* species can be detected in early childhood. Therefore, they may constitute a long-term

risk for the development of periodontal disease, and efforts should be taken in order to control the infection.^{11,30,31}

When patients are provided with appropriate information on how to prevent oral diseases and is followed by instructional preventive sessions, they substantially improve oral hygiene measures and gingival health. Furthermore, when the axis of a preventive dental program for infants is to make the parents aware of behaviors that the whole family can incorporate, the improvement in oral health can continue, even after the end of the program.

The present findings indicate that it is feasible to maintain satisfactory health habits among infants and toddlers, leading to a better dental plaque control and consequently better dental and periodontal conditions.

CONCLUSIONS

The results of the present investigation suggest that:

1. Children aged from 06 to 18 months followed by a Preventive Dental Program had a tendency to show fewer risks to develop gingivitis, compared to a group of children not submitted to any dental program.
2. The Preventive Dental Program has shown to be effective in reducing visible dental plaque, and also in establishing oral health habits among parents and young children.

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Deformational Brachycephaly in Supine-Sleeping Infants

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To reduce the prevalence of sudden infant death syndrome, the medical community returned to “back to sleep” campaign increasing the prevalence of positional plagiocephaly and brachycephaly. The study from the University of California, Los Angeles, state then in less than a decade, the normal head shape has changed from normocephalic to brachycephalic.

The authors recommend to alternate sleep practices, supine sleeping position from one side of the occiput to the other with tummy time when the infant is awake and under direct supervision.