

Mexican-American Parents with Children at Risk
for Baby Bottle Tooth Decay: Pilot Study at
Migrant Farmworkers Clinic.

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Baby bottle tooth decay (BBTD), a term endorsed by the Healthy Mothers - Healthy Babies Coalition, is a disease of young children, characterized by a distinctive pattern of severe tooth decay in the primary dentition. BBTD has been reported for children as young as eleven months. The term itself was selected to emphasize the frequent association of this form of caries with improper feeding practices. The four maxillary incisors are most affected, while the four mandibular incisors usually remain unaffected. Explanations for this pattern identify the pooling of milk or sweetened liquid from the bottle around maxillary incisors and other teeth of a sleeping child as the major etiologic factor. The tongue protecting the lower incisors explains the relative immunity of these teeth to caries. A necessary predisposing factor is the presence of high counts of *S. mutans*, usually transmitted from caretakers to infant. Many articles have identified the clinical appearance and etiology of the disease.^{1,2}

Treatment of severe BBTD in very young children often requires the use of general anesthetic. The cost of treatment is high. In 1987, Kelly and Bruerd noted

that the USPHS Indian Health Service and Head Start Bureau estimate cost of treating one child to be between \$700 and \$1000, another \$1000 would be needed if hospitalization is necessary.³ Informal surveys of colleagues across the country indicate that in 1991-92 the cost of treating BBTD is substantially higher than Kelly and Bruerd's estimates. Management procedures for the child less than two and a half years of age require physical restraint, sedation, or general anesthesia.

Numerous data regarding prevalence exist; problems in establishing true prevalence, however, are rife: accessibility and examination of preschool children are difficult and criteria for BBTD may be more or less stringent. Moreover, many samples of children attach various biases to the data, e.g., children examined at maternal and child health facilities.

Researchers have recognized that infant feeding patterns are influenced by cultural and ethnic factors and that results of studies of children within a given culture do not generalize. Results of studies from predominantly western-type cultures found with few exceptions the BBTD prevalence to be approximately 5 percent or less (Ripa, 1988).² Disadvantaged children, however, are more vulnerable. Data from Head Start Surveys indicate that 20 percent of our poor urban children in nonfluoridated and 15 percent in fluoridated communities, may be affected.^{4,5}

The highest rate of BBTD appears to be from Native-

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A prevalence rate of 70 percent BBT occurred in Eskimo children.

American children. Kelly and Bruerd (1987) examined 514 Native-American children at Head Start programs in Alaska and Oklahoma and found the prevalence of BBT to average over 50 percent.³ An even higher rate was found in children of the Navaho tribe from Arizona and the Cherokee tribe from Oklahoma: Broderick *et al* (1989) reported an overall prevalence rate of 70 percent.⁶ The most disastrous rate was found for Eskimo children: with Albert *et al* (1988) reported over 80 percent of 260 forty-nine-month old children required treatment.⁷

Immigrants are also vulnerable to this disease. It was reported that of two-year-old immigrants, 22.2 percent had caries compared to 4.5 percent of nonimmigrants in Sweden.⁸ Even among the disadvantaged group, there are some differences in the risk for developing BBT. Hispanic children are reported to have significantly higher proportion of nursing caries compared to black children (21 percent vs. 8 percent).⁹ Furthermore, children of Hispanic migrant farm workers are reported to have twice the decay rates of general populations.¹⁰ A problem with many of these studies is that the subjects were older Head Start children, between the ages of three and five years. This introduces retrospective and recall bias for studying the problem that manifests itself as early as eleven months of age.

DESCRIPTIVE STUDIES

Targeting preventive measures for children and their parents/guardians who are at greater risk appears to be a promising strategy; studies of individual differences of children and parents within a given population, with

the clear exception of identifying children who sleep with a bottle after age one, however, have been very limited. Dilley *et al* (1980) studied seventy-five BBT children in North Carolina and found that in almost half of these low-income children the mother was not the caretaker.¹¹ Mean age of initiation of oral hygiene activities was nineteen months, with a half of the children brushing without supervision. Mean age of discontinuation of the bedtime bottle was twenty-three months. No controls were included. Johnsen (1982) found in a study based in a pediatric dental clinic in a medical center in rural Morgantown, West Virginia that parents of children with no carious incisors, compared to parents of children with carious incisors, were more likely to be aware of potential problems sleeping with a bottle.¹² Forty percent of the parents of children with incisor lesions, however, were also aware of potential problems. Eighty-one percent of parents in this group had attempted substitution of water, 68 percent of them unsuccessfully. While ratings of general activity or curiosity were not associated with disease, perhaps because of technical problems with the scale, parents of caries-free children were more likely to give a higher rating to their ability to say "No" to the child when necessary. Children with lesions were also more likely to have parents who were obese and themselves were more likely to have a significant medical condition. In all, this important study provided the initial evidence that providing the parents with information often is not sufficient to change their parenting behaviors. In fact, these parents may have difficulty in managing both their own and their child's lifestyle-related behaviors.

In a 1984 study, Johnsen *et al* again found that simply making parents aware of BBT may not lead to a successful outcome.⁵ Results also indicated that children with smooth surface caries were more likely to be cared for by grandparents and were more likely to have mothers who permitted eating sweets without restrictions than in the case of caries-free children. Marino *et al* (1989), in a recent urban investigation, reported the results of twenty-four consecutive BBT patients in a private pediatric dental office; controls were children receiving routine pediatric care at a University-based clinical office.¹³ Children with BBT were more likely to be living in a single parent household and reported a higher incidence of sleep difficulties and a strong child temper. BBT cases also reported less professional advice as well as less fluoride supplementation. This was the first study that specifically implicated sleep problems in the etiology of BBT.

INTERVENTION STUDIES

The literature provides many suggestions for preventing BBTB. These strategies focus on information despite the findings of the modest success of this as a stand-alone approach. Prenatal classes; orientations at dental (and medical) visits at about twelve months of age, the critical time for prevention of BBTB and a naturally occurring time for discontinuing bottle feeding; and even Head Start programs with older children are all promoted.^{1,14,15} Unfortunately, few programs are evaluated; even short-term and controls of any sort are almost nonexistent.

Only one study attempted to intervene within Native American and Alaska native communities. Bruerd *et al* (1989) developed intervention methods that combined training of volunteer parents, health professionals, and child caretakers with a media campaign for twelve Native American communities.¹⁶ While in four years an overall decrease in BBTB prevalence from 57 percent to 43 percent was reported for Head Start children, controls were lacking.

Few studies attempted to target and identify high-risk children and their parents/caretakers. Most recommendations and intervention have focused on providing all parents/caretakers with the same information. On the other hand, Johnsen (1988) noted the heightened risk for children who sleep with the bottle beyond age one and who have a parent, especially the mother (or perhaps more appropriate for some subcultures "the caretaker"), who has a history of a high caries-rate.¹ Johnsen (1988) notes that the parent who is aware of the risk and allows the child to sleep with a bottle "presents a different challenge." The role of the dentist (health care professional) then becomes one of behavior modifier." We concur with this approach and believe that, while the descriptive literature provides hints concerning strategies that may be efficacious, little work has been accomplished.

While the importance of weaning at one year is often stated, the dental literature offers the parent/caretaker little actual help in managing this problem. Johnsen (1988) recommends that the parent sign a contract to get the child off the bottle within a month and that parents be counseled to anticipate and tolerate "several nights of crying through much of the night."¹ As an alternative he recommends sequential dilution of bottle contents over a two- or three-week period, realizing that immediate substitution of water is not acceptable to the child. Johnsen notes weaning at one year, how-

Parental awareness of BBTD does not assure a successful outcome.

ever, may not be culturally appropriate for many high-risk families.

Rather than promote weaning, it may be more productive to help the parent/caretaker disassociate nursing from sleeping behaviors. While the association of nursing and sleeping is considered a sleep disorder, it is not difficult to treat.¹⁷ Ferber's recommendations are to decrease gradually (and for some to water down) the amount of milk or juice the child takes when falling asleep. "Cold turkey" is not a reasonable alternative. Crying is managed by allowing the child to cry for a little longer each day until he or she falls asleep without nursing and without much fussing.¹⁸ Some children respond well to back rubbing or rocking during this process. Other psychological interventions are possible. Mothers and caretakers of at-risk children may benefit from developing both behavior change and self-management skills. These caretakers report permissive behaviors and seem to view child behavior as difficult to change (how do you alter temperament?). They may have difficulty controlling weight and have other lifestyle related problems that require self-control or self-regulation. It would not be far fetched to believe that they have difficulty managing stressful situations, i.e., demands made by a crying child, and perhaps an impatient spouse. It is believed by the authors that caretakers may benefit from the mastery of a few simple stress management strategies.

While noting the inability of many parents/caretakers of BBTB children to manage effectively their own and/or their children's problem behaviors, there have been no recommendations or studies aimed at this problem. It may not be necessary to insist on weaning

at one year, a process that may fly in the face of sub-cultural or cultural norms and/or may prove to be very difficult for the single parent/caretaker with a difficult (defined by temperament or illness) child. In fact, it may be that when individuals do not comply with professional recommendations, "They are in compliance with other social, emotional, or economic factors more central to well-being..."¹⁹ Moreover, given the above difficulties of parents/caretakers in modifying their childrearing practices to lower the risk of BBTB, it is surprising that there is a paucity of professionally applied interventions. Köhler *et al* (1982) have reduced high salivary counts of *S. mutans* in mothers by a program consisting of dietary counseling, professional tooth-cleaning with a fluoride-containing prophylaxis paste, oral hygiene instruction, topical fluoride application, at-home use of sodium fluoride mouth rinse, the treatment of large cavities, and in some cases the use of a chlorhexidine gel daily for two weeks.²⁰

At present we have limited knowledge of effective interventions for individuals from populations where BBTB is of epidemic proportions. Before development and testing of an intervention-strategy, it is necessary to study a targeted sample of individuals from a high-risk population(s). Given that ethnic, cultural, and economic factors are influential in determining childrearing practices, especially in regard to infant feeding practices, it may be important to study a specific high-risk group before intervening to better understand risk factors and to better formulate acceptable intervention.^{6,21,22}

METHOD

Subjects for this pilot study were parents and caretakers who enrolled a child less than four years of age in a Women Infant Children (WIC) or Maternal Child Health (MCH) program for migrant families in the Yakima Valley of central Washington.²³ These farmworkers are of Mexican descent, and many of them are recent immigrants. One hundred twenty-five children, eight* to forty-seven months, and their parents/caretakers participated.

All subjects were interviewed at the Yakima Valley Farmworkers Clinic by one of two trained bilingual interviewers. Interviewers were trained in interview skills, utilizing a training videotape made explicitly for this purpose.

The interview instrument attempted to assess demographic variables, child caretaking behaviors relevant to feeding and sleeping, knowledge and belief about BBTB, and willingness to comply with possible BBTB intervention strategies. Self-assessment of the dental health of child and caretaker, self-regulation questions, and the short form of the Parental Stress Index (Spanish version) were included.^{24,25} The interview instrument was translated into Spanish and back-translated in English for accuracy. Interviews were given in the language of the subject's choice. The interview took about forty-five minutes to administer. Immediately afterwards, each child was examined by a dentist with a mouth mirror, while seated in a dental chair with dental light. All the dental examinations were done by the author Mark Koday. Children were classified to have BBTB if two or more anterior teeth were decayed.

RESULTS

Overall, 37 of 125 children (29.6 percent) were found to have BBTB. Table 1 presents demographic information from the sample studied. The age of the baby was related to disease status, BBTB babies being older (33.0 months) than non-BBTB babies (25.3 months). Compared to non-BBTB babies, BBTB babies also had mothers with more education, a greater percentage, for example, having completed high school (16.2 percent vs. 11.6 percent).

The results of baby care questions are presented in Table 2. Less help with child care was found to be associated with BBTB. Surprisingly, the identity of the caregiver was important. Babies fed by other than mother and father in the P.M. were less likely to have BBTB; father putting baby to sleep during workdays was associated with BBTB. Giving the bottle to aid sleep and propping up the bottle were related to BBTB.

Table 1 □ Demographics of farmworker sample.

Variable	Total	BBTB	No BBTB
Sex (female)	56.0%	59.5%	54.5%
Baby's age (mos)**	28.2	33.0	25.3
Mother's age (yrs)	25.9	25.2	26.2
Father's age (yrs)	30.2	29.8	30.5
Number of persons in the household	5.4	5.2	5.5
Current address in months	34.7	27.4	37.7
Spanish preferred	66.1%	59.5%	69.0%
Mother born in Mexico	65.8%	60.0%	68.2%
Father born in Mexico	82.3%	81.8%	82.5%
Single family in residence	73.0%	81.1%	70.5%
Marital status (single mother)	45.2%	48.6%	43.7%
Mother's education (completed highschool)*	13.0%	16.2%	11.6%

* Differences significant at .05 level.

** Differences significant at .001 level.

*This eight-months-old case is one of the youngest reported of having BBTB.

Table 2 □ Baby care questions.

Variable	BBDT	No BBDT	Test statistics
Hours of help caring for baby	23	41	$t = -2.50, p = .03$
Baby fed by other than parent in PM	0%	10.5%	$\chi^2 = 4.56, p = .05$
Father puts baby to sleep workdays	13.9%	3.4%	$\chi^2 = 4.56, p = .03$
Father puts baby to sleep weekends	13.9%	8.0%	$\chi^2 = .987, p = .32$
Giving bottle as baby falls asleep	77.1%	46.5%	$\chi^2 = 13.24, p = .00$
Bottle propped up	63.9%	47.7%	$\chi^2 = 3.67, p = .05$
Age bottle stopped (less than 1 year)	8%	30%	$\chi^2 = 10.32, p = .06$

Table 3 □ Baby and parent characteristics.

Variable	BBDT	No BBDT	Test statistics
Baby			
Easy-going	89.2%	75.0%	$\chi^2 = 3.18, p = .07$
Strong-willed	70.3%	86.4%	$\chi^2 = 4.49, p = .03$
Sucks pacifier or thumb	6.1%	29.8%	$\chi^2 = 8.40, p = .00$
Hours of sleep	8.43	9.29	$t = -3.21, p = .00$
Parent			
Self-control (1 = very much like me, 5 = very much unlike me)			
Need help to stick to diet	3.09	2.20	$t = 2.44, p = .02$
Like to write down baby's height, weight, day he first spoke, etc.	2.64	3.43	$t = 2.10, p = .05$
Can ignore baby's urging when I have to	2.79	3.44	$t = -1.72, p = .08$
Parenting Stress Index items (1 = strongly agree, 5 = strongly disagree)			
Don't enjoy things as used to	4.33	3.72	$t = 2.02, p = .05$
My child does things to bother me just to be mean	3.46	4.46	$t = -3.42, p = .00$
My child acts strongly when something happens he dislikes	2.60	3.47	$t = -2.31, p = .02$

Not weaning at an early age was also found to be related to BBDT.

Table 3 presents results of questions assessing baby and parental characteristics. Babies with BBDT were viewed as more easy-going and less strong-willed than those children with no BBDT. BBDT babies were viewed, however, as reacting more strongly in a disagreeable situation than non-BBDT babies; similarly, BBDT babies are said to harass their caretakers more than non-BBDT babies. Non-BBDT babies were also reported to suck a pacifier or thumb much more frequently and to sleep slightly more hours (8.4 vs. 9.3 hours a day).

Non-BBDT parents reported a stronger feeling of being trapped by responsibilities as a parent than BBDT parents. Non-BBDT parents also noted a greater lack of enjoyment of life than BBDT parents. BBDT parents indicated they needed more help sticking to a diet than non-BBDT parents and that they were more likely to keep records of baby's height, weight, etc.

BBDT parents reported a greater ability to ignore baby crying when they have to than non-BBDT parents.

Table 4 presents the results of dentally related ques-

Table 4 □ Dental questions.

Variable	BBDT	No BBDT	Test statistics
Awareness of baby dental problems	91.4%	20.9%	$\chi^2 = 50.98, p = .00$
Remember being told about BBDT	66.7%	84.5%	$\chi^2 = 4.63, p = .03$
When told about BBDT (before birth)	52.2%	61.3%	$\chi^2 = 13.17, p = .00$
Bottle used now	32.4%	54.5%	$\chi^2 = 5.1, p = .02$
Baby has own brush	77.85	48.8%	$\chi^2 = 8.69, p = .00$
Baby has own toothpaste	62.9%	42.4%	$\chi^2 = 4.17, p = .04$
Mother cleans child's teeth	78.1%	44.0%	$\chi^2 = 10.81, p = .00$
Mother's last visit to dentist in years	2.8 yrs	1.4 yrs	$t = 2.14, p = .04$

Table 5 □ Ratings of unlikely/likely to follow specific recommendations. (1 = very unlikely, 5 = very likely)

Recommendation	BBDT \bar{X} (SD)	No BBDT \bar{X} (SD)
A. Immediately substitute cup for bottle for all feedings	3.62 (1.93)	4.40 (1.40)*
B. Substitute cup slowly, once a day for first week	3.71 (1.90)	4.15 (1.64)
C. Water down milk or juice slowly	4.10 (1.66)	4.16 (1.63)
D. Substitute artificial sweetener for sugar	4.07 (1.65)	4.10 (1.68)
E. Immediately cut out nighttime feedings, even if baby cries	4.07 (1.62)	3.94 (1.76)
F. Slowly reduce amount in nighttime bottle and increase time between feedings	3.97 (1.72)	4.20 (1.59)
G. Put fluoride drops in bottle once a day	3.93 (1.77)	3.96 (1.76)

* t value significant at .021 level

tions. Over 90 percent of BBDT parents and 20 percent of non-BBDT parents were aware of their babies' dental problems. Two thirds of BBDT parents and 84.3 percent of non-BBDT parents remembered previous information about the consequences of putting the baby to sleep with a bottle. The BBDT group reported that they learned about BBDT when the child was older. For example, 52.2 percent of the BBDT group and 61.3 percent of the non-BBDT group were told about BBDT before the birth of the child.

BBDT parents report less frequent use of the bottle (32.4 percent) than non-BBDT parents (54.5 percent). BBDT parents also profess to clean the child's teeth regularly (62.9 percent for BBDT vs. 44.0 percent for non-BBDT parents). Similarly, BBDT parents report baby has his/her own brush and uses toothpaste at a much greater rate than non-BBDT parents.

BBDT parents visited a dentist on average 2.8 years ago, while non-BBDT parents reported 1.4 years between visits.

Table 5 presents the similarity of BBDT and non-BBDT parents in following a range of recommendations to "help the baby keep his or her front teeth from becoming decayed and toothachy." Only one difference was manifest for the seven recommendations: BBDT parents were less likely than non-BBDT parents to substitute immediately the cup for the bottle for all feedings.

DISCUSSION

Mexican-American farmworkers face multiple postmigration stresses associated with acculturation. While childrearing practices are culturally determined, they are often modified during this stressful process of acculturation. Results of this study suggest that when Mexican-American mothers receive more help in child care their babies have less BBT. This finding is buttressed by the finding that Hispanics, especially those who are less acculturated, rely on family support to lessen the impact of stress.²⁶ The identity of the caregiver, however, is important. When the baby is fed in the evening by someone other than mother or father, the baby is less likely to have BBT. It may be that this other person is careful not to give the bottle while the baby falls asleep, or to prop the bottle, both practices found to be associated with BBT in the study. On the other hand, when the father puts the baby to sleep in the evening, he may be less knowledgeable about BBT or less skilled in putting the child to sleep without reliance on bottles. It is interesting that this relationship was found for week nights and not for weekends, when the father may have more interest or energy.

The temperament of the baby presents puzzling results. While babies who are reported to be more easygoing and less strong-willed were found to have BBT, those babies with BBT were also viewed as reacting strongly "when something happens that my child doesn't like" and as doing "things that bother me just to be mean." Such seemingly contradictory observations may make more sense in light of parent-child management practices. Busy and stressed parents may not attend to children who are not usually demanding. Such children may react very strongly, however, when frustrated by inconsistent and inattentive childrearing practices and may respond by engaging in negative attention-seeking behavior. This interpretation is supported in part by the finding that parents of BBT children are more able to ignore baby's crying, when they have to.

Results indicate that parents whose children do not have BBT face greater stress and perhaps even depression. Those parents who wean at an early age and do not provide nighttime bottles must face the wrath of the baby. The price of following the childrearing practice of the new culture is high. Moreover, the dominant Anglo culture provides few alternatives.²⁷ Usually, the health providers recommend the substitution of a cup for a bottle at one year with no exceptions. The common-sense alternative of substituting

water for cariogenic liquid is not likely to be of much help. Johnsen (1982) found that while the majority of parents of children with lesions reported they had attempted substitution, 68 percent were unsuccessful.¹² It appears that BBT parents are much less willing to expose themselves to the stress of early weaning and sleeping without the bottle. In not following the health providers recommendations they reap other benefits, e.g., sleep, lack of conflict, etc. It may now not be so surprising to note the greater maternal education was associated with BBT; overall education levels, however, were very low (16.2 percent completed high school in BBT group; 11.6 percent for non-BBT group). Nationally, the percent of Mexican-American mothers completing high school is 19.3.²⁸ This finding is contrary to that of Johnsen *et al* (1984), where Head Start mothers of caries-free children were more likely to have completed high school than mothers of children with smooth-surface lesions.⁵ Other studies have agreed with Johnsen's findings.²⁹⁻³¹

These responses may indicate that BBT parents may require special support, in order to achieve behavior change objectives. Health professionals who are interested in altering feeding patterns in infants and toddlers must realize that any change in feeding routine will affect the entire household or family system. A change in the child's feeding routine will initiate other changes that will affect nearly every member of the family system. Some of these effects will be viewed as at least disruptive, and certainly some of the effects will be judged as unacceptable, and ultimately the change in the child's feeding pattern will be rejected. Parents are aware that there are substantive decisions to be made regarding child rearing and dental caries. They are also aware that not all babies who use a nursing bottle at night get BBT. Caries as an infection of multifactorial etiology has a relatively long "incubation" period between its initiation and the observed cavitation of enamel. Parents and caretakers may be lulled into complacency, therefore, during this incubation period. The parents may have also perceived that the particular nursing-bottle-feeding practice has resulted in a "quieter baby, healthier baby" etc. Thus, parents may be left with the dilemma of risking dental disease, if a perceived beneficial feeding pattern is maintained. We believe that parents often choose to take the "gamble" and continue the dentally problematic behavior, in lieu of altering the feeding pattern. Obviously, the "cost" of changing the behavior is deemed excessive in light of the disruption and upset in the household that it would cause. Given the infrequent

contact with dentists that the average of a visit every 2.8 years implies, these parents are simply making the best choice available to them.

We believe that future interventions to prevent and reduce the damaging sequelae of BBTB should include effective professionally supervised therapies that do not depend on parent or patient compliance and behavioral interventions that are presented as a menu of alternatives from which parents can choose. We propose that topical applications of fluoride and chlorhexidine hold great promise for preventing BBTB for infants at high risk for the disease. In addition, parents of these high-risk children should choose one or more behavioral approaches which they would be willing to initiate within their household. Parents who are allowed to choose from a number of practical and effective behavioral interventions would be more likely to agree to comply over time. Obviously, both the "hands-on" professional intervention and the household intervention will require considerable support and structure. Contracting, reminders, contingency management and other proven aids to behavioral change may prove useful. The high risk parent can be guided through these difficult childrearing tasks.

In order to solve behavioral problems and to change habits that are health-related, individuals need self-control skills.^{32,33} BBTB parents indicated that they need help in sticking to a diet and that they like to write down baby's height, weight, etc. These responses may indicate that BBTB parents may need and may respond to pragmatic assistance in coping with the dilemma of either upsetting baby, who disrupts the household, in an attempt at preventing dental disease or allowing traditional placating childrearing practice to result in disfiguring dental disease. At present BBTB parents seem to opt for the latter alternative: they choose to manage the sequela of the disease. After the child has the disease they clean his or her teeth and profess to stop using the bottle. To our way of thinking, they close the barn door too late; we doubt they believe that metaphor applies, given the low dental IQ that visits every 2.8 years implies; they are simply making the best choice possible. On the other hand, a program that offers viable (and tested) alternatives to approaches that are not too unattractive to choose may prove to be successful. Such programs must provide considerable support and structure, i.e. step-by-step procedures with forms to check off and reminders. The high risk parent can be guided through this difficult childrearing task.

It must be noted that this is a pilot study, with relatively small numbers of subjects and a large number

of significance tests. Clearly, this work must be replicated. In addition, BBTB children were found to be older than those for whom we locate non-BBTB. It may be that a more limited age-range should be studied; the wide age-range may contribute to mask findings, as some younger children in the non-BBTB group will acquire BBTB as they mature.

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BREAST-FED CHILDREN WITH RAMPANT CARIES

This study aimed to investigate the prevalence of selected components of the oral microflora in breast-fed children who developed rampant caries (resembling nursing caries) under hitherto unexplained circumstances. Dental plaque and saliva samples were collected from breast-fed children, aged between 1 and 2.5 years, with and without rampant caries. Mutans streptococci and lactobacilli were isolated from dental plaque of all children with rampant caries and from most caries-free children. None of the colonies of mutans streptococci resembled those of *Streptococcus sobrinus*. The mean counts of the mutans streptococci and lactobacilli were 100-fold higher in plaque samples from children with rampant caries as compared with caries-free children. No difference could be found between the numbers of mutans streptococci in plaque overlaying cavities and that from adjacent sound enamel. In contrast, the counts of lactobacilli in plaque were approximately 100-fold higher from cavities than from sound surfaces. The levels of mutans streptococci in saliva were directly related to the presence of rampant caries. The results show that caries-free and caries-active breast-fed children, aged 1 to 2.5 years, harbour mutans streptococci and lactobacilli on their teeth. Rampant caries in these children can occur in the absence of nursing bottles or any other feeding abuse during weaning and in the presence of an aciduric plaque microflora, as has been reported for children with nursing bottle caries.

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