BRIEF COMMUNICATIONS

Colonization of Mutans Streptococci in 8- to 15-month-old Children

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Abstract

Objective: *The age at which a child becomes colonized with mutans streptococci (MS) is important for understanding early childhood caries. The aim of this study was to explore the relationship of age with MS colonization in infants.* ***Methods:*** *Inner-city children (n=149) between the ages of 8 months and 15 months, inclusive, who reportedly were still using a baby bottle, were sampled for MS.* ***Results:*** *Evidence of MS colonization was seen as early at 10 months of age. For children 12 months old or younger (n=80), 25 percent had detectable levels of MS; in the 15-month age group, 60 percent were colonized.* ***Conclusion:*** *This study suggests that prevention of MS colonization in some populations may need to be initiated prior to the child's first birthday. [J Public Health Dent 1998;58(3):248-9]*

Key Words: infant oral health, mutans streptococci, early childhood caries.

Early childhood caries (ECC) is a distinct caries pattern often associated with prolonged, frequent, and inappropriate feeding of cariogenic foodstuffs. The decay pattern most often involves the maxillary incisors, usually does not affect the mandibular incisors, and may progress to involve the canines and molars of both arches (1). Mutans streptococci (MS) colonization is regarded as one of the principal factors involved in ECC (2).

The age at which a child becomes colonized with MS is important for understanding the disease process, timing preventive interventions, and determining a child's caries risk. Several studies have shown that the earlier MS is detected in children, the higher the caries experience (3,4). However, reports regarding the time of colonization are contradictory. One study reported detectable MS in plaque from children as young as 13 months and in 40 percent of the children by the age of 2 years (5). Another early study reported detectable MS in 7 percent of children 4–13 months old and in 29 percent of children 8–18 months old (6). More recently, it was reported that 6 percent of 1-year-olds studied were colonized with mutans streptococci (7). Finally, another study noted that the acquisition of MS occurs between 19 and 31 months of age (8).

The purpose of this study, which was part of a larger study on the relationship of mutans streptococci with age, teeth, and bottle content (9), was to further explore the relationship of age with mutans streptococci colonization in infants.

Methods

Eight- to 15-month-old children enrolled in the Hartford Women, Infants, Children (WIC) program were screened for their possible participation in this study. WIC is a federal program that provides food, education, and referrals for health care to high-risk, low-income women and children. Eligibility criteria for the study were that the child: (1) was still using the nursing bottle; (2) had four or more teeth, two of which were maxillary incisors; (3) was initially caries free; (4) had no visible enamel defects; and (5) had no significant medical problems that might have interfered with his or her ability to continue the study for two years. Those children who were eligible and whose parents consented to participate became the convenience sample of 149 children that were examined for MS colonization.

After study procedures were explained and informed consent was obtain, microbial sampling for MS was performed. Saliva was collected from each infant by placing a sterile wooden tongue blade on the dorsum of the tongue until the blade was visibly moistened. The tongue blade was impressed onto plates containing MSKB, a medium selective for mutans streptococci (10). The plates then were incubated in a candle jar at 37°C for 72 hours. MS levels were assessed by counting the number of colony-forming units (CFUs) resembling mutans streptococci within the impression area. The number of CFUs was recorded and categorized into one of the following groups: low (0 CFU), moderate (1–50 CFUs), or high (>50 CFUs).

Results

The level of mutans streptococci colonization as a function of child's age was assessed (Figure 1). Thirty-five percent of the 149 8- to 15-month-old children were colonized with MS. Evidence of MS colonization was seen as early as 10 months of age, with 14 percent of the children in that age group colonized. Overall, a trend toward an increasing percentage of children colonized with increasing age was observed. For children 12 months old and younger (n=80), 25 percent had detectable levels of salivary MS; in the 15-month age group 60 percent of children were colonized.

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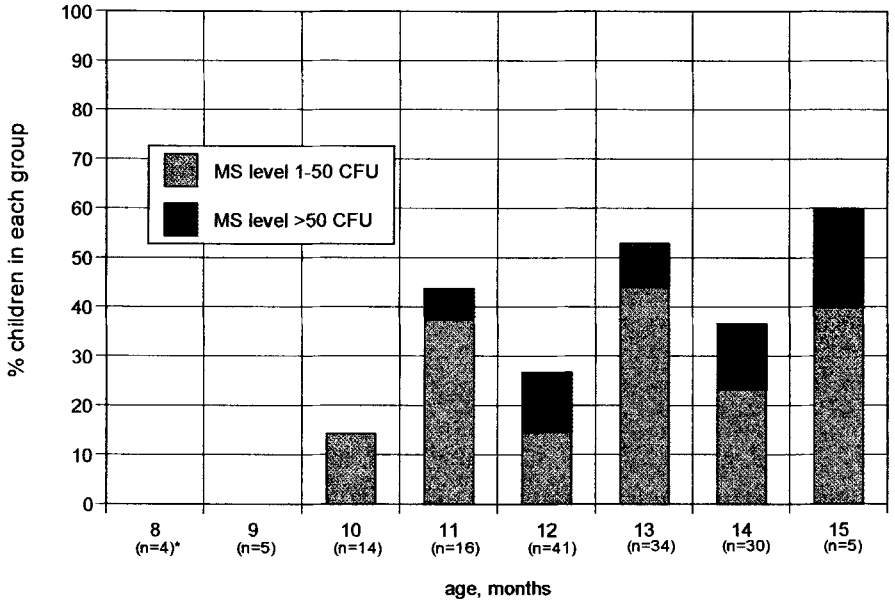
FIGURE 1
Percentages of the 149 Children 8–15 Months Old Colonized by Mutans Streptococci (*n*=total number of children in each age group)



Discussion

These findings add to the information regarding MS colonization in infants and toddlers. They reinforce earlier findings that MS colonization can occur shortly after tooth eruption (6); however, they contrast with findings that colonization occurs principally in the second year of life (8). The present data showing colonization as early as 10 months may even be conservative, because the tongue blade method used in this study collects only those microorganisms that have been shed from the teeth. Plaque sampling probably would have detected a greater level of MS colonization in more children (11).

This cross-sectional descriptive study shows that children younger than 1 year of age may be colonized by mutans streptococci. It should be recognized that these results are not generalizable to all children because the sample selected included children from low socioeconomic backgrounds still using the nursing bottle. However, such children who are bottle fed after 1 year of age collectively are often target groups for programs to prevent ECC. One goal in the prevention of ECC is to prolong the time during which a child remains MS free. Proper timing of prevention efforts requires knowledge of when colonization with MS occurs in the population being considered. This study suggests that prevention of MS colonization in some populations may need initiation prior to the child's first birthday.

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