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The influence of early counselling on weaning from a bottle

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Objectives: To evaluate the effectiveness of intensive counselling on bottle weaning. ***Methods***: A randomised prospective controlled study was conducted. Parents of 4-month-old babies who attended an inner-city clinic affiliated with the Department of Paediatrics, University of Louisville, Louisville, Kentucky with predominately African-American, indigent population were invited to participate. The parent/infant pairs were randomized to either intervention or control groups. Demographic information was recorded and both groups were surveyed on the parent's beliefs and knowledge of weaning from the bottle. The intervention group parents received scripted counselling, including use of feeding cups, and were shown pictures of severe early childhood caries and a dental model of early childhood caries at four, six, nine, and 12 month visits. Two paediatricians who are on the clinic staff used the same script when talking to parents while showing the same photos and dental model to assure symmetry. The control group parents received brief counselling on the use of a feeding cup at 6 month and bottle weaning at nine and 12 months with no photographs or dental models shown. Two dentists, blinded to the group assignment, examined all of the children between the ages of 12 months and 24 months. ***Results***: One hundred eighty-five parent/infant pairs were enrolled and 132 pairs (65 control and 67 intervention) remained at the end of the study. Demographic variables, socioeconomic status and race were similar for both groups. When surveyed, more of the control mothers believed that children should be weaned by 12 months (p=0.049). Yet, only 17% of their infants were weaned by 12 months, compared to 27% of the intervention infants (p=0.168). ***Conclusion***: This small study demonstrated no change in parental behaviour after intense counselling.

Key words: baby bottle, dental caries, weaning

Introduction

For many years the recommendation has been to wean the baby from the baby bottle by 12 months of age. There are several problems related to long term baby bottle exposure. Inappropriate feeding practices with the baby bottle are associated with dental caries in young children. Known for many years as baby bottle tooth decay, early childhood caries (ECC) is a distinctive pattern of rampant decay that classically presents in a child aged six or younger (Paediatric Dentistry Reference Manual, 2004). Children from low-income families are also at higher risk for experiencing dental caries and among minority populations in the United States, ECC is in epidemic proportions (Pinkham et al., 1998; Johnsen, 1982).

It has been recognized as a significant public health problem (Proceedings, 1998; Oral Health in America: A Report of the Surgeon General, 2000). The U.S. Surgeon General in the report, "Oral Health in America", stated that dental caries is the single most common chronic childhood disease – five times more common than asthma and seven times more common than hayfever (Oral Health in America: A Report of the Surgeon General, 2000).

To educate parents and to identify disease early, the American Academy of Paediatrics (AAP) recommends that every child should begin to receive oral health risk assessment by six months of age from a paediatrician or a qualified paediatric health professional (American Academy of Paediatrics, 2003). The AAP Guidelines for Health Supervision II recommends the introduction of the cup at eight months of age and complete weaning by 15 to 18 months of age (Korsch et al., 1988). The recommendations of the American Academy of Paediatric Dentistry (AAPD) are: 1) No bottle in bed or ad libitum nocturnal breastfeeding, 2) Wean from the bottle by 12 to 14 months, 3) Juice should be from a cup, not a bottle, 4) Oral hygiene should begin with the eruption of the first tooth, 5) The first professional visit should occur within six months of the eruption of the first tooth, no later than 12 months, 6) Measures should be taken to lower the mutans streptococci levels of the mother/primary caregiver to decrease the risk of developing ECC. (AAPD, 2004)

The literature contains contradictory information on when to wean despite strong recommendations from the AAP (Frazier et al., 1998). Specified ages to achieve weaning varied from 12 to 18 months. Koranyi et al., (1991) reported that 94% of paediatricians provide information to parents about weaning and that 80% recommend specific ages to begin and accomplish bottle weaning, 12 and 16 months respectively. Frazier et al., (1998) observed that vague and inconsistent recommendations from experts hamper the counselling and education efforts among physicians. Furthermore, there is evidence that some types of parental education may not work well in high-risk populations (Benitez et al., 1994; O'Sullivan and Tinanoff, 1993). Children with ECC are more likely to have parents who do not know that it is wrong to put a child to bed with a bottle (O'Sullivan and Tinanoff, 1993; Febres et al., 1997). Some authors feel that par-

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ents are not aware of the problems associated with late weaning and these parents are not knowledgeable about current weaning recommendations (Frazier et al., 1998; Febres et al., 1997; Dilley et al., 1980). Other authors have found that some parents resist professional advice and are influenced by uninformed peers or convenience to feed with a baby bottle for an inappropriate time (O'Sullivan and Tinanoff, 1993; Johnsen 1982).

The purpose of our study was to evaluate the effectiveness of early intensive counselling on bottle weaning, to determine the age of the child when the parent adopted the professional advice concerning the cessation of bottle feeding.

Methods

This study was conducted between September 1999 and June 2002 at the Children and Youth Project of the Department of Paediatrics, University of Louisville, Louisville, Kentucky. It is a paediatric clinic providing longitudinal comprehensive care to an inner-city, predominately African-American population. Following approval by the human studies committee, all parents of four-month-old infants attending the clinic for well-child visits between September 1999 and June 2000 were invited to participate. After informed consent was obtained, the parent/infant pairs were randomly enrolled: either to the intervention group or to the control group. Demographic information was recorded and both groups were surveyed on their beliefs on weaning.

At the four, six, nine, and 12 month well baby visits, parents in the intervention group received scripted, standardized counselling (Table 1) including the use of feeding cups by nine months of age, from two paediatricians, Also, the parents were shown photographs of early childhood caries (ECC) and using a dental model, the lingual aspect of upper incisors were pointed out as early and easily missed sites of ECC.

The control parents received brief counselling on the use of a feeding cup at six months and bottle weaning at nine and 12 months. No photographs of ECC or dental model were shown to the control parents.

Two dentists who were blinded as to the group assignment, conducted a dental examination of the children between 12 and 24 months of age. Each child received a complete dental examination with a mirror and #23 explorer to determine the presence or absence of decay. No white spot lesions, only frank caries with cavitation were recorded. Children with one to five carious surfaces were described as "mild" caries, while children with six or more carious surfaces were described as "severe" caries.

Data was analyzed using the Fisher's Exact Test and the Chi-Square Analysis to look at the association between independent variables. Odds ratio and 95% confidence intervals were determined for differences. Significance was defined at p value ≤ 0.05.

Results

Enrolled in the study were 185 parent/infant pairs; 53 were lost to follow-up and 132 (67 intervention, 65 controls) remained in the study. There was no significant difference in demographic variables. Majority were African-

Table 1. Scripted Counselling

At 4 months old:

- Put your baby to bed without a bottle
- Do not prop the bottle
- Always cradle your baby in your arms when feeding to avoid ear infections
- Your baby should be off the bottle by 12 months of age
- Show pictures of milk bottle caries and dental model

At 6 months old:

- Put your baby to bed without a bottle at naptime and night time
- Do not use the bottle as a pacifier
- Wipe off teeth and gums after the last feeding of the day
- Your baby should be off the bottle by 12 months of age
- Show pictures of milk bottle caries and dental model

At 9 months old:

- Put your baby to bed without a bottle
- Encourage drinking from a cup for milk, juice, or water
- Put only milk in the bottle
- Reduce bottle feedings to 4 times a day
- Give toast or feeding biscuits for self-feeding
- Offer table food while the child is at the table with the family
- Wipe off teeth and gums after the last feeding of the day
- Your child should be off the bottle by the next well child visit at 12 months of age
- Show pictures of milk bottle caries and dental model

At 12 months old:

- Your child should be off the bottle totally by the first birthday
- Brush your child's teeth with a soft bristle brush without tooth paste
- Brush in the morning and just before bedtime
- Show pictures of milk bottle caries and dental model

Table 2. Weaning belief and actual practice

	Control Group (n=65)	*Study Group (n=67)*	*p-value*
At what age should you wean your baby?			
4-6 months old	1	8	
7-9 months old	14	17	0.049
10-12 months old	41 (68%)	31 (49%)	
>12 months old	4		
Totally weaned from the bottle at 12 months old			
Yes	11 (17%)	18 (27%)	0.168
No	54 (83%)	49 (73%)	

American (p=0.28), indigent, and inner-city residents, which mirrors the racial and socioeconomic distribution of the clinic population. Half of the parents in each group completed high school and 13-16% had greater than 12 years of education (p=0.82). Two-thirds of the families in both groups had two or more children in the household (p=0.48). There were 63% and 81% term births among the control and intervention groups (p=0.025).

No significant difference was noted between the two groups in regards to knowledge of weaning. When asked when a feeding cup should be introduced, 58% and 64% of intervention and control parents respectively stated that it should occur by nine months of age. The majority (83% control; 87% intervention) of the parents stated they would not put their baby to bed with a bottle. Just slightly over half (57% control; 62% intervention) of the parents knew prolonged bottle feeding can cause dental problems and thought that the first visit to the dentist should be at 10-12 months of age.

Belief in weaning from the bottle at 12 months of age was statistically significant (p=0.049) between the two groups with 68% (41 of 65) of parents in the control group and 49% (31 of 67) of intervention parents stating that weaning should occur at 12 months. However, actual weaning by 12 months of age occurred in fewer of the control infants (17%, 11 of 65) compared to the intervention infants (27%, 18 of 67), but this difference was not significant (p=0.168).

Between the ages of 12 and 24 months, there were 86 and 96 dental examinations for the control and intervention groups respectively. Among the 132 children aged 12-24 months, the prevalence of dental caries was 8%: 7% had mild caries (defined as one to five carious surfaces) and 1% had severe caries (defined as six or more carious surfaces). Mild caries was found in four controls (at ages 14, 18 months, and two at 24 months) and in five intervention children (at ages 12, 15, and three at 24 months). Only two children had severe caries and both were found in the control group at 24 months of age. There was no significant difference between the control and intervention group in the frequency of caries. Among the rest of our clinic population, 2,692 preventive dental examinations were performed in a 12-month period by the clinic's dentists, including 232 children aged 12-23 months. In this latter age group, a caries-free diagnosis was made in 92% (213 of 232) and dental caries in 8% (19 of 232).

Discussion

A review of the literature shows that several factors are involved in weaning decisions for parents. Among socially disadvantaged parents, Avery and Baxter (2001) reported that more than 60% thought that the age at which the use of a bottle should be discontinued was older than that recommended. Other studies observed that parents with low educational levels (Johnsen, 1982; Kaste and Gift, 1995), as well as low-income level (Johnsen, 1982), and urban residence were associated with prolonged bottle use (Kaste and Gift, 1995). These are the same factors noted by Kaste and Gift (1995) and similarly we found a low number of children weaned in a timely manner. Hammer et al. (1999), on the other hand, reporting on the feeding practices of well educated, middle class parents found the frequency of late bottle weaning was related to the timing of the mother's return to work. Mothers who returned to work during the first three months postpartum weaned sooner from the breast and later from the bottle than women who returned to work after three months postpartum. It was also noted that more than 40% were still on the bottle at 24 months of age, 16% at 36 months, and 8% at 48 months of life. The timing of weaning appears to be multi-factorial.

Education is important for timely weaning, to prevent early childhood caries, the primary deleterious effect of inappropriate bottle feeding. Kowash et al. (2000) found that home visits every three months after the eruption of primary teeth made no difference in weaning times, but did show a decrease in the incidence of early childhood caries. Our survey of parental beliefs on weaning, conducted before any counselling, showed that the majority of our parents in both the intervention and the control groups (83% and 87% respectively) knew it was wrong to put their baby to bed with a baby bottle and slightly over half (57% control, 62% intervention) of the parents knew prolonged bottle feeding can cause dental problems.

Our intervention of intense counselling at 4, 6, 9, and 12 month well baby visits, did not result in a statistically significant number of children weaned by 12 months of age (p=0.168). When intensive counselling was given, only 10% more children, compared to the control group, were weaned at an appropriate time. This is contrary to the findings of previous studies (Benitez et al., 1994; Johnsen, 1982; Johnsen et al., 1984; Kelly and Bruerd, 1987; Weinstein et al., 1992).

Healthcare professionals often inappropriately separate dental health from other health functions (Tang, 1997). Contrary to the latter observation, our clinic has a milieu of coordinated, multiprofessional comprehensive care of high-risk infants and children. Our children showed a prevalence of dental caries of 8%, significantly lower when compared to 20% of two-year-olds of similar socio-economic background reported by Tang (1997) and to the 10% of 13-18 month olds and 36% of 19-24 month olds in Blen's (Blen et al., 1999) study of children attending a university dental clinic. We speculated that the lower prevalence of dental caries in our patient population may be due in part to our multidisciplinary approach to and emphasis on preventive health care.

Weaning habits and early childhood caries should be a concern for all professionals who work with expectant or new parents and very young children (Tang, 1997). In addition to early anticipatory guidance on weaning at 12 months, with emphasis on ECC as a consequence of late weaning, parents should receive detailed instruction on how to handle demanding infants. Useful strategies for an infant or child with sleep difficulties are especially important as an alternative to the use of the milk bottle to soothe the crying infant. The establishment of structured bedtime routines, especially for the difficult to manage child, may reduce the parental need to use food as a calming mechanism and thereby decrease prolonged bottle feeding and early childhood caries.

Conclusion

Weaning is a multi-faceted concern for parents and healthcare providers. Our study has shown that early, focused and repeated parent education with graphic visual aids made no statistical improvement in weaning outcomes. These low-income, high risk parents were not motivated to change their habits and wean their babies by 12 months of age after intervention. Further research into the type and form of instruction is needed. It is possible that different learning styles may require different approaches by educators.

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