Association between breastfeeding and eruption of the first tooth in preschool children in Nigeria

ABSTRACT

Aim This study specifically examines the effect of the form and duration of breastfeeding on the timing of eruption of the first tooth in Nigerian children

Study design The study included 398 children aged 6 months to 71 months. The mothers were asked to provide information on the duration and form of breastfeeding, and the age of eruption of the first deciduous teeth. The socioeconomic status (SES) of the child was calculated using the mother’s level of education and the father’s occupation. Intraoral examination was conducted to assess the teeth present and dentition status of the child. A tooth was considered present in the mouth when any part of the tooth was visible.

Results There was no association found between the duration of breastfeeding ($p=0.48$), form of breast feeding ($p=0.61$), duration of exclusive breast feeding ($p=0.41$) and timing of eruption of the first tooth.

Conclusion The duration of breast feeding does not affect the timing of eruption of the first deciduous tooth, neither does the form of breastfeeding.

Keywords Breast feeding; Nigeria; Tooth eruption.

Introduction

Exclusive breastfeeding in the first six months of life has been shown to have many advantages. This is relevant in Nigeria where infant mortality has been put at 91/1000 life birth (NHIS, 2001). The high and unacceptable rate has been attributed to common causes which include preventable diseases like anaemia, diarrhoea and malnutrition.

The advantage of exclusive breastfeeding is bi-directional. For the child, it ensures nutritional adequacy as the infant receives all the nutrients needed for optimal growth [Abiona, 2001]. It also reduces the risk of infection by reducing the exposure of the child to enteropathogens that may contaminate other type of food [Pickering and Kohl, 1986; Takala et al., 1989; Kliegman et al., 1979]. In addition, it has other health benefits which include the enhancement of cognitive development [Morrow-Tlucak et al., 1998]. For the mothers, breastfeeding increases the level of oxytocin in the blood resulting in less post-partum bleeding and more rapid uterine involution [Chua et al., 1994]. It also favours early return to pre-pregnant weight [Dewey et al., 1993], delays resumption of ovulation with increased child spacing [Kennedy and Visness, 1992; Gray et al., 1990], reduces tendencies to hip fracture [Melton et al., 1993; Cumming and Klineberg, 1992], and decreases the risk of ovarian [Rosenblatt and Thomas, 1993] and premenopausal breast cancers [Newcomb et al., 1994].

Despite the numerous articles published on breastfeeding and the health of the mother and child, very few studies have investigated the effects of exclusive breast feeding on the oral health of the child. Most of the studies on breastfeeding and the oral health looked into the relationship of breastfeeding and caries [Tsoubuchi et al., 1994; 2009; Hallonsten et al., 1995; Weerheijm et al., 1998; 1995; 2008; 2007]. These studies have remained inconclusive on the role of breast milk as a cariogenic agent.

There are equally very few studies on the effect of breast feeding on tooth eruption [Kitamura, 1942; Kramer and Kakuma, 2002]. This cross-sectional study specifically examines the association between form and duration of breastfeeding on the timing of eruption of the first tooth in Nigerian children.

Materials and methods

This is a cross-sectional study. Study samples were recruited from three randomly selected local government areas from the list of 20 local government areas in Lagos State, Nigeria. The local government areas were stratified into urban, peri-urban and rural areas. One local government was chosen from the three stratifications. In the urban and peri-urban local government areas, paediatric outpatient clinics were used for clinical examination while in rural local government areas, community town halls were used for the clinical examination. A paediatric out patients clinic was not available within the rural local government area. The
study was conducted in the local government’s central hall after a door-to-door informative campaign on the study was done. A table of random numbers (Fisher and Yates, 1953) was employed to select the hospitals used in the urban and peri-urban local government areas.

Permission to conduct the research was granted by the Ethical Committee, Lagos University Teaching Hospital, Lagos and the Health authorities of the two hospitals involved in the study.

All the children between the age of 6 and 71 months present at the above-mentioned study venues participated after verbal consent was obtained from their mothers following due explanation of the study. Written informed consent was not sought from the study participants as there often were concerns expressed by community members about the need to append their signatures to documents. This is often viewed as giving away some of their rights. The study was sensitive to this reality and only sought ethical approval for verbal consenting since the study associated risk was not more than that encountered during daily life.

A questionnaire was administered and clinical oral examinations were conducted. One of the authors carried out all examinations. A calibrating examination was carried out earlier on a group of pre-selected children with the same characteristics to be assessed in the main survey in order to assess intra-examiner reproducibility of the study. This involved a group of 23 primary school students who were examined and re-examined a week later by the same examiner. Intra-examiner clinical reproducibility of result was 100%. Necessary adjustments were made to the questionnaire and ambiguities corrected through a pilot testing of the questionnaire before the final survey.

The pre-tested structured questionnaire consisted of demographic information on the child, feeding practices and practices related to oral health. The age of the child was calculated from the date of birth in months. The mothers were also questioned on the duration and form of breastfeeding. Breastfeeding was classified as exclusive when the mother gave only breast milk without any other supplements. The type of breastfeeding was defined as almost exclusively breast fed if water or other non-nutritive liquids were used in addition to breastfeeding. Partial (mixed) breastfeeding indicate mixed feeding with breast milk and other sources of energy and nutrients [Kramer and Kakuma, 2002].

The socioeconomic status (SES) was obtained through assessment of the mother’s level of education and the father’s occupation. This index allocated each child to a social class ranging from I to V with the social class V being at the bottom [Olusanya, 1984]. For statistical analysis, the SES was classified as high (SES I and II), middle (SES III) and low (SES IV and V).

The mothers of the children were also asked to recall the age of eruption of the first deciduous tooth. Only those cases where the time of tooth eruption could be recalled - without guessing - were recorded.

During the intraoral examination of each subject it was assessed the number of teeth present and dentition status of the child. A tooth was considered present in the mouth when any part of it was visible.

Data were analysed using the Intercooled STATA for Windows. A mixed effects logistic regression model with random effects for each child and each tooth was fitted. In this model, the predictor was the breastfeeding status of the child, and the outcome was the presence of the first tooth. Age, sex, and socioeconomic status were adjusted. Also association of predictive factors and asymmetries between teeth using likelihood ratio tests were tested. Statistical significance was inferred at p < 0.05.

Result

Over the study period, data was collected from 398 children, of which 217 (54.5%) were males. Of the 398 children, details on breastfeeding form were collected for 383 children. Two (0.5%) of these children did not breastfed, 207 (54.1%) had exclusive breastfeeding from 1 to 18 months of age; 93 (24.3%) children were almost exclusively breastfed while 81 (21.2%) received partial breastfeeding. The modal period for exclusive breastfeeding was 6 months (25.4%) (Table 1). The duration of breastfeeding ranged from 2 months to 34 months for 376 children with the modal period been 12 months (21%).

Two hundred and sixty eight mothers could recall the timing of eruption of the first tooth of their children (Table 1).

The duration of breastfeeding had no effect on the timing of eruption of the first tooth (p=0.48). The form of breastfeeding also had no effect on the timing of eruption of the first tooth (p=0.61), neither did the duration of exclusive breastfeeding (p=0.41).

Discussion and conclusion

In comparison to bovine milk, human breast milk has a lower mineral, higher concentration of lactose and less protein. An in vitro study of human breast milk concluded that human breast milk does not cause a significant pH drop in plaque, it supports moderate bacterial growth, its buffer capacity is very poor and it is not cariogenic, unless another carbohydrate source is available for bacterial fermentation. However there is no identified study on the possible effect of its properties on tooth eruption timing.

A previous study by Folayan et al. [2007] on timing of deciduous teeth eruption in Nigerian children noted that there was no association found between breastfeeding and deciduous teeth eruption. However, they noted that
such effect may be better observed and reported with respect to the teeth that erupt during the first active phase of eruption.

The results of this study further note that duration and form of breastfeeding had no significant effect on the timing of eruption of the first tooth. Previous studies [Abiona, 2001; Ibe, 1999] reported on the many advantages of exclusive breastfeeding including its significant impact on the weight of the child between birth and 6 months - with exclusively breastfed children gaining more weight than those not exclusively breastfed – with possibly better nutritional status of these children. Despite these identified advantages of children exclusively breastfed, there appears to be no direct effect on the timing of eruption of the first tooth in this study population. Thus, while the virtues of exclusive breastfeeding may be promoted for a number of good reasons, early tooth eruption may not be one of them.

A limitation of the study however is the cross-sectional design where mothers have to recall the age of eruption of the first tooth. While the study made effort to include only mothers who could recall such dates without having to guess or when uncertainty regarding the date was noted, this does not rule out recall bias resulting in information error in this data collection process. Bland et al. [2003] noted that long-term recall of breastfeeding practices are less accurate, being only 40% specific at 6 months, though Li et al. [2005] noted that the reliability and validity of the mother’s recall on breastfeeding data was high for the first 36 months. A prospective study design would be more effective in collecting this type of information so as to reduce these identified errors.

Within the limitation of the design of this study, the results demonstrate that there is no association between the duration and form of breastfeeding, and the timing of eruption of the first deciduous tooth. There is also no association between exclusive breastfeeding and the timing of eruption of the first deciduous tooth.

Acknowledgement

Dr. E. Rotimi who read through the manuscript and provided editorial guidance.

References

› Kitamura S. A study on the time an order of eruption of human teeth II (in Tokyo, Japan). Shikwa Gakuho 47: 352 – 368