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Feeding practices in late infancy in Benin City, Edo State, Nigeria

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Abstract: *Background:* Whereas considerable insight has been gained and progress made in optimum feeding in early infant feeding same cannot be said with nutrition in late infancy. Tacking challenges associated with nutrition in late infancy demands that extant practices and their shortcomings are exposed.
Objectives: To evaluate and document practices regarding feeding in late infancy in Benin City, Edo State, Nigeria.
Methods: Using a community-based household survey involving three representative political wards in Egor Local Government Area of Benin City, feeding practices in late infancy were evaluated using a mix of structured and non-structured, pre-tested questionnaires on 522 mothers of infants aged >6months to 11 months. This was done between June and September, 2009.
Results: The age range of mothers was 17-48 years. Diverse ethnic groups were represented with the Binis constituting the largest (48.6%). Bottle feeding rate (BOTFR) was 2.55% and Bottle feeding practice was unassociated with maternal occupation (X^2 = 2.741; p=0.740) and family socio-economic status ($\mathbf{X^2}$=10.145; p=0.930). Timely complimentary feeding rate (TCFR) was very high (92.7%). Delayed introduction of complimentary feeding was very low (3.6%). Maize gruel (pap) was the commonest (76.6%) complementary food utilized and commonly (99.5%) this was enriched with a variety of other items with milk as the commonest item used. Fish was the commonest (41.0%) animal product used as complimentary food. Use of animal feeds was however generally low and their use was uninfluenced by family socio-economic status (X^2 = 5.424, p=0.066).
Conclusions/Recommendations: Bottle feeding rate remains unacceptably high even into late infancy. Factors fostering this should be exposed and tackled because of the dangers inherent in the practice. Timely complimentary feeding practice is encouraging and needs to be supported and sustained for its benefits.

Key Words: Nutrition, Late, Infancy, Complimentary feeding, Benin City.

Introduction

Late infancy is a period of immense opportunity for the consolidation on the gains accruing from rapid growth and development occasioned by appropriate nutrition in early infancy.[1] Whereas it is widely acknowledged that exclusive breastfeeding provides enough fluids and nutrients for growth and development in first half of infancy[2-4] investigators have also revealed that growth faltering peaks when complementary feeds are introduced as a result of poor complementary feeding practices.[5]

This implies that promoting optimal complementary feeding is as important as promoting exclusive breastfeeding. In many low-income countries of the world, complementary feeds are often introduced too early, fed in inadequate amounts, not given at the right frequency, low in nutrient density, and prepared and delivered in unsafe manners.[5-7]
Sub-optimal feeding practices lead to malnutrition,[4-6] which is a contributory factor in 60% of under-5 mortalities in sub-Saharan Africa.[6,8] It has been estimated that if breastfeeding and complementary feeding are practiced as recommended, up to 19% of under-5 deaths would be averted.[9]
Adequate attention has not been given to late infant feeding as compared to exclusive breastfeeding in Nigeria[5,12] If the target of the millennium development goal-four (MDG-4) are to be met efforts must be made to improve feeding in late infancy. These strategies should proceed from studies that seek to document current feeding practices during the critical transition period in infant nutrition. This could form the basis of interven-

tional measures designed to enthrone adequate nutrition at this critical age group.

Subjects and methods

Study Design/Location

The cross-sectional, descriptive and community based study was carried out in Egor Local Government Area (LGA) of Edo State, between June and September 2009, using community based design consistent with the recommendations of the World Health Organization (WHO).[13]

Sampling Method

Applying a multi-stage random sampling method three of the 10 political wards of the LGA were selected. It was therefore assumed that the total population was evenly distributed among the 10 existing wards. On the basis of equal distribution of 68,748 women of child bearing age among the wards, an equal number of 356 mothers were recruited from the three wards to make up a sample size of 1068.

The method of subject identification was similar to that used by the Expanded Programme on Immunization (EPI).[14] All households in the randomly selected directions were visited and eligible respondents consecutively recruited until ward boundaries were reached. This procedure was repeated from many central locations in the ward until the required number of respondents was met.

Subjects were visited at times that were convenient to them. Using researcher administered questionnaire information on nutrition in late infancy and family socio-demographic parameters were obtained relying on 24 hour recall principle as recommended by WHO.[13] The socio-economic stratification of the families of subjects was carried out as described by Olusanya *et al*.[15]

Ethical Clearance

The University of Benin Teaching Hospital's Ethics Committee, Edo State Ministry of Health and Egor Local Government Council gave their approval for the study.

Data Analysis

Data was entered directly into the Statistical Package for Social Science (SPSS) spread sheet and checked for accuracy. They were subsequently analysed using version 15. The students' t-test was used to compare means generated from continuous variable and p-value of < 0.05 was considered significant.

Results

Of the 1068 mothers interviewed 522 or 48.9% had babies that were aged> 6-11 months.

Bottle Feeding and Maternal Characteristics

Of the 522 infants aged >6-11 months, 133 (25.5%) were bottle-fed giving a bottle-feeding rate (BOTFR) of 25.5%. Twenty or 30.7% of full time housewives, two (28.6%) top civil servants/professionals, 42 (26.9%) fashion designers/hairdressers, seven (25.9%) teachers and 50(22.9%) traders bottle-fed their infants. There was no significant association between maternal occupation and bottle-feeding (X^2 =2.741; p=0.740). Sixteen (23.9%) mothers from high socio-economic class bottle-fed whereas 51(25.2%) and 66 (26.1%) from the middle and low social classes respectively also bottle-fed. The practice of bottle feeding was not significantly associated with family socio-economic status (X^2=10.145; p=0.930).

Timely Complementary Feeding

Of the 355 infants aged 6-9 months, 329 or 92.7% received a combination of breast milk and complimentary feeds. Thus, the timely complementary feeding rate (TCFR) was 92.7%. Thus majority of infants who ought to be on complementary feeding did so.

Delayed Introduction of Complementary feeds

Of the 522 infants only 19(3.6%) were not receiving complementary feeds at the time of interview. Mothers' reasons for this delay included "ample breast milk flow", infant's refusal of complementary feeds and several issues bothering on ignorance.

Complementary Foods Utilized

The maize gruel popularly known as "pap" was consumed by 400 (76.6%) of 522 infants aged 6-11 months. Other food consumed included rice, fish, beans, fruits, roots and tubers. Over a period of 24 hours (the dietary recall period), infants consumed numerous food items leading to overlap. Pap contributed 29.7%, fish, 16.0%; rice, 15.5%; beans, 8.4%; fruits, 7.0%; Indomie noodles, 6.0%; Garri, 5.4%; egg, 3.7%; yam, 3.2%; fortified commercial cereals, 3.3% and meat contributed the least, 1.8%.

Pap was the commonest food item used for complementary feeding while fish was the commonest animal product used. Out of the 522 infants only 24(4.6%) received meat, 215(41.2%) received fish, 94(18%) received fruits and 45(8.6%) were fed on fortified commercial complementary foods. The use of meat was low among study population and majority made use of home-made complementary food which was predominantly carbohydrates.

Socio-Economic Status and Use of Animal Products as Complementary Foods

Thirty-five (51.5%) mothers from high social class, 79 (40.1%) from the middle class and 101(39.3%) from the low social class gave their infants fish. However, social class was not significantly associated with the use of

fish (X^2=3.442; p=0.179). Seven (10.3%) mothers from high socio-economic class offered their infants egg whereas 20 (10.2%) and 22(8.5%) from the middle and low socio-economic classes respectively, offered their infants the same food item. There was no significant relationship between social class and use of egg (X^2=0.444; p=0.801).

From the high, middle and low socio-economic classes five (7.4%), 12(6.1%) and six (2.3%) mothers respectively offered their infants meat. Although mothers from the low socio class were less likely to offer meat to their infants there was no significant association between use of meat and socio-economic class (X^2=5.424; p=0.066).

Table 1: Social-economic status and consumption of fish among infants aged 6-11 months

Social Class	Use of fish Yes n(%)	No n (%)	Total n (%)
High (Classes I & II)	35(51.5)	33(48.5)	68(100.0)
Middle (Social Class III)	79(40.1)	118(59.9)	197(100.0)
Low (Classes IV & V)	101(39.3)	156(60.7)	257(100.0)
Total	215(41.2)	307(58.8)	522(100.0)

X^2=3.442; df : 2; p = 0.179.

Items Used For Pap Enrichment

Table 2 shows the food items used for pap enrichment. Of the 400 infants who received pap, 398 (99.5%) had some items added unto it in a bid to enrich it. Some mothers used two or more items. Milk was the commonest item used. The use of sugar as an enriching item was low. Of the 398 mothers who enriched pap, 351 (88.2%) consistently added only one item, 42(10.6%) added two while five (1.3%) added three items.

Table 2: Food items used for enriching pap

Food Item	frequency	%
Protein rich items		
Milk	365	77.8%
Soya bean	66	14.1
Ground crayfish	17	3.6
Energy dense items		
Sugar	10	2.1
Beverages	07	1.5
Others	04	0.9
Total	469	100.0

Discussion

The timely complementary feeding rate observed in the present study was 92.7%. This was much higher than the national average of 64%.[16] Earlier studies in Benin City however did not estimate timely complementary feeding rate. The high rate noted in Benin City was not surprising as the prevalent challenge had more to do with early or premature introduction than late introduction of complementary feeds. This notwithstanding, 3.6% infants who ought to have been on complementary feeding were not. Reasons given for this delay included ample breast milk supply and issues bothering on ignorance on the part of the parents.

It is important to educate mothers on the need to introduce complementary foods at six months despite mother's ample milk flow and infant's ostensible satisfaction with breast milk. It is also important to educate mothers on the art of timely introduction of complementary feeds to improve acceptance among babies. Maize gruel differently known as pap, Ogi or Akamu, was the commonest complementary food utilised. Fish was the commonest animal product used as complementary food. Some authors had reported the use of animal product as being commoner among high income families because of cost.[81] In this study however there was no significant association between socio-economic class and use of animal products as complementary feeds. This is possibly due to the fact that fish, the commonest animal item for complementary feeding is less expensive in the study locale, particularly the frozen type, thus cost may not have been an issue. The use of meat was not popular in the study. Perhaps this may have to do with cultural norms that discourage the early introduction of meat to the staples of growing children. Meat is a rich source of protein, iron and zinc. Mothers should be encouraged to puree meat and offer it to their infants. Even in Northern Nigeria where the rearing of cattle is prevalent, the use of meat as complementary food is acknowledged to be low. Iliyasu *et al*[18] in 2005 reported that only 4.2% of their study population from Kano did.

Many authors have noted pap as the commonest complementary food not just in Nigeria but also in most parts of West Africa.[5,17,19,20] About a decade earlier, Okparaocha *et al* had reported 83.8% use of pap.[19] In the present study 99.5% of infants who received pap had it enriched with one, two or three items but in Okparaocha's study, only 49% of infants receiving pap had it enriched. Okparaocha's finding was comparable to findings from a study conducted in Kano in 2005 where 41.8% of infants on complementary feeds received pap that was not enriched.[18] The scope of items for enrichment however, have remained the same in Benin City over the preceding 10 years. These include protein rich items as milk in powdered form, soya bean, and ground crayfish. Energy dense item such as sugar was also used and in few instances mothers utilised salt. Most (88%) infants received pap enriched with only one item and this could be inadequate.

Nutrient and calorie density of maize gruel is improved when up to three items are added especially items sourced from legumes or animal products. Soya bean was the only legume used in the present study. The use of sugar was low and no mother used palm oil. The use of sugar is believed by mothers to cause diarrhoea and diabetes later in life. Palm oil is in abundant supply in Benin City and its environ and it is a rich source of vitamin A. Failure to use it as an enriching item possibly stems from ignorance or aversion. Palm oil permanently stains the container when feeding bottles or plastic bowls are used. This may cause mothers to reject the product. This problem may be solved by encouraging mothers to use stainless steel bowls and spoons while

carrying out complementary feeding.
Sugar makes the maize gruel more palatable and easily acceptable. However, excessive use of the product may cause dental caries. Those who added salt claimed it was for the prevention of abdominal pain and that attempts earlier made to add other items had resulted in food rejection or diarrhoea. The addition of salt to pap is unwarranted as it adds no special value to the feeds at that age. It may in fact contribute to the development of hypertension in later life.[5,21] Milk was the commonest item used. This probably stemmed from the ready availability of pre-packaged powdered milk which is cheap. The increased proportion of mothers who served enriched pap to their babies in the present study in comparison to what obtained a decade earlier may be a reflection of effects of the heightened promotion of appropriate complementary feeding in antenatal clinics and immunization centres.

The bottle feeding rate among infants aged 6- <12 months was 25.5 %. This figure is lower than the 30% reported by Ogunlesi in Ilesa[22] in 2005 but higher than the 19.4% noted by Okparaocha *et al*[19] earlier in Benin City. However the two earlier studies were carried out among children aged 0-12 months. In Saudi Arabia, the bottle feeding rate by three months of infancy was 76%.[23] The differences noted in the BFR may have to do with the level of affluence in the different societies studied. In the present study bottle-feeding was rampant even at the onset of late infancy. This is the age group in which most mothers who do not practice exclusive breastfeeding introduce semi-solids. Early introduction of complementary feeds is associated with the use of feeding bottles.[24] The increased incidence in the use of feeding bottles in Benin City in the last decade may be indicative of the fact that some aspects of the "Ten Steps to Successful Breastfeeding" no longer receive adequate attention or support.

Conclusion

In conclusion, maize gruel has remained the commonest complementary food utilized but more mothers now enrich it even though the quality of enrichment remains inadequate and questionable. We recommend that female education should continue to receive support from government and parents as most studies have demonstrated that higher maternal education is significantly associated with optimal infant feeding practices.

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