

## COMPLEMENTARY-FEEDING PATTERN IN A POPULATION OF PRESCHOOL CHILDREN: ANY RELATIONSHIP WITH CURRENT FEEDING HABIT?

By

SAMUEL N. UWAEZUOKE<sup>1</sup> AND GIDEON C. ILECHUKWU<sup>2</sup>

<sup>1</sup>*Principal Research Fellow Institute of Child Health*

<sup>2</sup>*Senior Registrar, Department of Paediatrics, University of Nigeria Teaching Hospital (U.N.T.H), Enugu, Nigeria.*

### SUMMARY

**Objective:** It has been postulated that offering bland diets to infants could habituate to food refusal during early childhood.

To investigate the complementary feeding pattern in Nigerian preschool children and a possible association with their current feeding habits, a cross-sectional study of two hundred (200) children was done in Enugu, eastern Nigeria.

**Method:** Their mothers were interviewed with a structured questionnaire.

**Results:** Irrespective of socio-economic status, majority of the children were commenced on complementary foods between 4 and 6 months of life, which mainly consisted of poorly fortified home-prepared cereals. A higher percentage (90%) of the children who exhibited food-refusal habit at the time of study were given cereals not fortified with sweeteners, compared to about 75% of their counterparts without this habit who were similarly fed. The difference between the two groups was however not statistically significant ( $\chi^2 = 0.795$ ,  $p > 0.05$ ).

**Conclusion:** Although a valid association has not been established between complementary feeding pattern and food refusal, a longitudinal study may be required to establish any causal relationship.

---

**Key words:** *Complementary feeding, preschool children, food refusal, association.*

### INTRODUCTION

It is universally recommended that complementary feeding should be started at 4 to 6 months of life in order to fill the calorie and nutrient gaps required for optimum growth<sup>1</sup>. Delayed or premature initiation of complementary feeding may lead to deterioration of nutritional status and increased risk of infections, especially diarrhoeal diseases; a phenomenon termed the 'weanling's dilemma'<sup>2-4</sup>. Therefore, complementary foods should be appropriately timed, nutritionally adequate and hygienically prepared. Adding variety to complementary foods and sweeteners to home-prepared cereals will improve their nutritive value and palatability.

But a recent survey of some developing countries has shown that both the nutritive value and energy density of cereal-based complementary foods were relatively poor<sup>5</sup>. Worse still, most care-givers in this environment avoid adding sweeteners to home-prepared cereals because they believe it could cause childhood diarrhoea<sup>6-8</sup>. It is hypothesized that the bland diet thus offered to the infant may predispose to refusal of food due to the unpleasantness he associates with it. This habit is a common feature of feeding behaviour later in life, especially in the preschool age<sup>9,10</sup>. The present study was conducted to investigate the historical pattern of complementary feeding in a population of Nigerian preschool children, and

### Correspondence Address:

*Dr. S. N. Uwaezuoke, Institute of Child Health  
U.N.T.H. Enugu, E-mail: [snuwaezuoke@yahoo.com](mailto:snuwaezuoke@yahoo.com)*

*Phone: 042/302970, 08033248108 (mobile)*

*Accepted for Publication: 11<sup>th</sup> September 2004*

to determine if there is any association with their current feeding habits.

## SUBJECTS AND METHODS

This cross-sectional study was conducted at the Children Outpatient Clinic of the University of Nigeria Teaching Hospital in Enugu, a cosmopolitan city in Eastern Nigeria. A child was eligible for the study if he was aged between 1 and 5 years; did not appear chronically ill; and showed no features of protein energy malnutrition (P.E.M) according to the Wellcome classification.

Two hundred (200) children who met the criteria were recruited during the period of study using the systematic sampling method. Their mothers were interviewed with a structured questionnaire comprising open-ended questions on biodata (child's age and parent's educational status/occupation) as well as closed-ended questions on feeding practices during infancy such as nature of feeding from birth, age/type of complementary feeding, type of home-prepared cereals and methods of fortification. Excluding sweeteners such as glucose, refined sugar and honey, fortification with one, two and three or more nutritional additives namely milk, beverage, soya beans or crayfish or groundnut, oil, fruits and vegetables were reported as single, double and multiple mix respectively.

The children's current feeding behaviour was also probed from their mothers. Data was analyzed using EPI-INFO Version 5 computer package. Findings were subjected to chi-square test and 0.05 level of significant was adopted. Social classification of subjects using the parent's educational attainment and occupation was based on the method described by Oyedeji<sup>11</sup>.

## RESULTS

Majority (69%) of the preschool children were aged 12 – 32 months, as shown in Table 1. (Mean age,  $28.7 \pm 12.4$  months). They were distributed according to their parent's social class as follows; classes I (13%), II (15%), III (12%), IV (27%) and V (33%). Thus, most of

them (60%) belonged to the lower socio-economic group.

Table 1 Biodata of the Preschool Children

Age range (months)*	N = 200 (%)
12 – 22	82 (41)
23 – 32	56 (28)
33 – 42	30 (15)
43 – 52	16 (8)
53 – 62	16 (8)
Parent's Social class	
I	26 (13)
II	30 (15)
III	24 (12)
IV	54 (27)
V	66 (33)
*Mean age, $28.7 \pm 12.4$ months	

A sizeable number (56%) of the subjects were predominantly breastfed from birth while 37% had exclusive breastfeeding. The remaining received breast-milk substitute alone (2%); breast milk substitute and breast milk (2%); cereals and breast milk (2%); as well as breast milk, breast milk substitute and cereals (1%). Interestingly, most (57%) of these children were commenced on complementary feeding from the age of 4 to 6 months, while 35% had premature introduction. Only few (8%) started receiving complementary feeding after 6 months. A comparative analysis of the children across the five social classes also shows that within each socio-economic group, majority of them were introduced to complementary feeding from 4 to 6 months (Table 2).

Most (67%) of the children were given home-prepared cereals. Few (11%) received only commercially-packaged cereals and 22% were offered both. In Table 3, a hundred and thirty-eight (77.5%) of the hundred and seventy-eight children who received home-prepared cereals were offered maize-based cereals; making maize the most frequently used local cereal. The most common method of fortification was double mix without sweeteners

(50.6%) while the least common method was multiple mixes with sweeteners (3.4%).

With respect to the use of sweeteners in home-prepared cereals, a comparison of the children with food refusal (N = 40) and their counterparts who did not exhibit this habit (N = 138) showed that a higher percentage (90%)

were given cereals not fortified with sweeteners while about 75% of the children with normal feeding habit were similarly fed (Table 4). The difference between the two groups was however not statistically significant ( $\chi^2 = 0.795$ ,  $df = 1$ ,  $p > 0.05$ ).

Table 2 Age of commencing complementary feeding versus Parent's social class

AGE RANGE (months)	SOCIAL CLASS				
	I (n=26)	II (n=30)	III (n=24)	IV (n = 54)	V (n=66)
0 – 3 (n = 70)	4	8	10	24	24
4 – 6 (n = 114)	20	18	12	28	36
7 – 9 (n = 14)	2	4	2	2	4
10 – 12 (n = 2)	-	-	-	-	2

TABLE 3 The types and methods of fortification of home-prepared cereals

Types of cereal	n = 178 (%)
Maize	138 (77.5)
Millet	14 (7.9)
Both maize and millet	24 (13.5)
Others (rice)	2 (1.1)
Methods of fortification <sup>+</sup>	
Single mix with sweeteners	16 (9.0)
Single mix without sweeteners	16 (9.0)
Double mix with sweeteners	34 (19.0)
Double mix without sweeteners	90 (50.6)
Multiple mix with sweeteners	6 (3.4)
Multiple mix without sweeteners	16 (9.0)

<sup>+</sup>Excluding sweeteners like glucose/refined sugar or honey, use of one, two and three or more of the following nutritional additives (milk, beverage, soya-beans/groundnut/crayfish, oil, fruits or vegetables) refers to single, double and multiple mix respectively

Table 4 Children with food refusal vs. Children with normal feeding against the method of fortification of home-prepared cereals

Method of fortification	Children with food Refusal n = 40 (%)	Children normal feeding habit n = 138 (%)
Fortified cereals with sweeteners	4 (10.0)	34 (24.6)
Fortified cereals without sweeteners	36 (90.0)	104 (75.4)

$\chi^2 = 0.795$  ( $df = 1$ ,  $p > 0.05$ )

## DISCUSSION

Despite the infant-feeding recommendation of 4 to 6 months of exclusive breastfeeding to be followed by gradual introduction of complementary foods, poor parental adherence appears to be common in many developing countries<sup>12, 13</sup>. In this study, majority of the children were introduced to complementary foods between the age of 4 and 6 months; a practice that was independent of maternal socioeconomic status. This finding agrees with the mean age of  $4.4 \pm 0.99$  months reported in Lahore, Pakistan by other workers<sup>14</sup> who however noted premature complementary feeding in infants of upper socioeconomic class and literate mothers. Conversely, it differs from the observations of Vaahtera et al<sup>12</sup> in rural Malawi, where complementary foods were introduced at the median age of 2.5 months and better compliance to feeding recommendations was dependent on small family size, increased maternal education and socioeconomic status. The encouraging trend in the present study should therefore be sustained or improved with appropriate health-education interventions because a review of existing data from published studies which investigated outcomes in relation to the age of initiating complementary feeding, showed no clear evidence to support a change in the current feeding recommendation<sup>15</sup>. In fact, complementary foods offered before 6 months of age tend to displace breast milk and do not confer any growth advantage over exclusive breastfeeding<sup>16</sup>.

The most common pattern of complementary feeding in this study was the use of poorly fortified home-prepared cereals, which confirms the report by Trèche and Mbome<sup>5</sup> that the energy density and nutritive value of local complementary foods in many developing countries are suboptimal. Notably, the preponderance of the subjects in our study within the lower socio-economic group, could explain this finding although maternal knowledge and beliefs may be contributory. For instance, the erroneous perception in this locality that adding sweeteners to home-

prepared cereals has a causal association with childhood diarrhea is well documented<sup>6,8</sup>. It is therefore not surprising that about 50.6% of the preschool children who were fed with home-prepared cereals, received inadequately fortified complementary foods during infancy (reported as double mix without sweeteners). Hypothetically, the practice of offering such bland home-prepared cereals to the child could habituate to refusal of food. It is interesting to note that a higher percentage of children in this study who exhibited the habit of food refusal at the time of survey were historically given cereals not fortified with sweeteners when compared to their counterparts with normal feeding habit whose complementary foods were not similarly fortified. Although the predisposing factors of this behaviour disorder common in preschool children are food-forcing by parents and the child's 'negativism' characteristic of his developmental phase<sup>9,18,19</sup>, this study has highlighted a possible link with the pattern of complementary feeding during infancy. Arvedson<sup>20</sup> has noted that the management of this feeding disorder is designed to make feeding enjoyable and nutritionally adequate. Admittedly, there was no statistically significant difference between the percentage of children with food refusal and that of their counterparts with normal feeding habit who received complementary foods without sweeteners.

In conclusion, the study has shown that a sizeable number of mothers still practice exclusive or predominant breastfeeding, commence complementary feeding at the recommended age but use poorly fortified home-based cereals. Interestingly, the common practice of not adding sweeteners to cereals was observed more frequently in the diet recall of the children who exhibited the habit of food refusal. It is recommended that a longitudinal study should be conducted as a follow-up to validate this finding.

## ACKNOWLEDGEMENTS

We are greatly indebted to the Paediatric interns who helped in the collection of data.

Mrs. N. Jude-Ejekam also deserves special thanks for her excellent secretarial work and data processing/analyses with the computer.

## REFERENCES

1. Saadeh R, Martines J, King FS. Complementary Feeding – Family foods for breastfed children. Department of Nutrition for Health and Development. World Health Organization, 2000 : 3 – 8.
2. Hop LT, Gross R, Giay T, et al. Premature complementary feeding is associated with poorer growth of Vietnamese children. *J Nutr* 2000; 130 (II): 2683 – 90.
3. Davies-Adetugbo AA, Adetugbo K. Effect of early complementary feeding on nutritional status in term infants in rural Nigeria. *Nutr Health* 1997; 12(1): 25 – 31.
4. Rowland MGM. The weanling's dilemma: are we making progress? *Acta Paediatr Scand* 1986; 323 : 33 – 42.
5. Trèche S, Mbome IL. Viscosity, energy density and osmolality of gruels for infants prepared from locally produced commercial flours in some developing countries. *Int J Food Sci Nutr* 1999; 50: 117 – 25.
6. Asobie FC, Igboeli CC, Okeibunor JC. Indegenous Perceptions of childhood diarrhoea in Enugu : Implications for diarrhoea prevention. *Nig J Paediatr* 1994; 21 (suppl): 55 – 65.
7. Ogbuagu KF, Eneanya CI, Ebenebe JC. Igbo Mothers' Perceptions and Treatment of Diarrhoea in Eastern Nigeria. *Nig J Paediatr* 1994; 21 (suppl): 30 – 38.
8. Akitoye CO, Ekanem EE. Folk concepts of diarrhoea and caretakers' knowledge and utilization of salt-sugar solution in Peri-urban Lagos. *Nig J Paediatr* 1994; 21 (suppl); 137 – 144.
9. Robinson MJ. Some common behavioural disturbances in children. In : Robinson MJ, Lee EL, editors. *Paediatric Problems in Tropical countries*. 1<sup>st</sup> ed. Churchill Livingstone, Edingburgh, 1978: 9 – 12.
10. Young B, Drewett R. Eating behaviour and its variability in 1 year-old children. *Appetite* 2000; 35: 171 – 7.
11. Oyedeji GA. Socioeconomic and cultural background of hospitalized children in Ilesha. *Nig J Paediatr* 1985; 12 : 111 – 7.
12. Vaahtera M, Kulmala T, Hietanen A, et al. Breastfeeding and complementary feeding practices in rural Malawi. *Acta Paediatr* 2001; 90 (3): 328 – 32.
13. Morgan J, Stording J. Infant feeding practices in the 90's. *Health Visit* 1995; 62 (2): 56 – 68.
14. Kulsoom U., Saeed A. Breast feeding practices and beliefs about weaning among mothers of infants aged 0 – 12 months. *J Pak Med Assoc* 1997; 47(2): 54 – 60.
15. Lanigan JA, Bishop J, Kimber AC, Morgan J. Systematic review concerning the age of introduction of complementary foods to the healthy full-term infant. *Eur J Clin Nutr* 2001; 55 (5): 309 – 20.
16. Dewey KG. Nutrition, growth and complementary feeding of the breastfed infant. *Pediatr Clin North Am* 2001; 48 (1): 87 – 104.
17. Sanders MR, Patel RK, Le Grice B, Shepherd RW. Children with persistent feeding difficulties: an observational analysis of the feeding interactions of problem and non-problem eaters. *Health Psychol* 1993; 12: 64 – 73.
18. Illingworth RS. *Common Symptoms of Diseases in Children*. 9<sup>th</sup> ed. Blackwell Scientific Publications, Oxford 1988: 66.
19. Chatoor I. Infantile anorexia nervosa: a developmental disorder of separation and individuation. *J Am Acad Psychoanal* 1989; 17: 43 – 64.
20. Arvedson JC. Behavioural issues and implications with paediatric feeding disorders. *Sem Speech Lang* 1997; 18: 51 – 69.