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Effect of Cultural Beliefs and Forbidden Foods on the ABCD Parameters of Nutrition among Some Children in Nigeria

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Abstract: Under nutrition is not uncommon in Nigeria. It is the major form of malnutrition among children. Evidence indicates that half of the 4 million African children under 5 years who die annually are undernourished. Cultural attitudes of parents toward certain foods may contribute to children's under nutrition. This study correlates food prejudice and beliefs to the nutritional status of some children using the ABCD (Anthropometric, Biochemical, Clinical and Diet) methods of assessment. Four hundred and twenty-four children between the ages of 1 and 8 years, were selected randomly from rural communities and urban centres in Delta State, Nigeria. The children were separated into test and control groups based on their parents' attitude to cultural food prejudice. Children of those that practice food prejudice were the test group while those whose parents do not uphold the practice were the control group. Results of the anthropometric measurements show that the test subjects had mean±SEM height, weight, arm and head circumference of 85.5±5.2cm, 18.5±1.7kg, 15.2±1.3cm and 42.3±1.9cm, as against 113.9±3.6cm, 26.4±1.6kg, 22.3±1.5cm and 54.7±2.2cm for the control children, respectively. The mean±SEM serum total protein, albumin, urea and creatinine values obtained for the test subjects were 39.8±3.4g/L, 27.0±1.6g/L, 2.0±0.2mmol/L and 0.07±0.02mmol/L, while those for the control were 71.2±3.0g/L, 46.4±1.8g/L, 3.6±0.8mmol/L and 0.06±0.01mmol/L. Statistical analysis of the anthropometric and biochemical data using the Student's *t*-test indicate that the test subjects' mean values (except serum urea and creatinine) were significantly lower ($P<0.05$) compared with control data. Clinical examination of skin, hair, face and teeth show features of under nutrition especially among the test children. Evaluation of dietary history revealed deficiency in protein and micronutrients in the diets of test children. Our study implicates food prejudice and prohibition as strong factor responsible for under nutrition of children in especially the rural communities. Most parents of the undernourished children were poor and illiterate. Campaigns should be initiated to educate rural populace on the dangers of strongly upholding beliefs and superstitions that deny children of adequate nutrient supply. Parents should be empowered in order to improve their socioeconomic status and illiteracy level.

Key words: Beliefs · Under nutrition · Urea · Creatinine · Illiteracy · Food prejudice

INTRODUCTION

Food provides both the energy and nutrients needed to build and maintain all body cells. As humans grow through early years into adulthood, the needs for energy and nutrients change. Infants need more energy, protein, vitamins and minerals per kg body weight than do adults to support their tremendous growth and development and as growth tapers, children need and eat proportionately less [1].

The single best indicator of a child's nutritional status is growth [2] and this is rapid in children. However, in developing nations including ours, undernutrition is common among children. Undernutrition is the most common form of malnutrition among the poor in both developing and developed countries. About half of the 4 million African children under 5 years of age who die annually are undernourished [3]. It has been reported that in the US more than 34,000 children die each day of undernutrition and related preventable diseases and one

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out of every four children goes hungry or is at risk for inadequate food [4].

In addition to poverty, cultural attitudes toward certain foods may contribute to children's undernutrition. In certain areas of India, a child may not be fed milk curds, because of a superstitious belief that they inhibit growth, or bananas, because they supposedly cause convulsions. In some part of Edo Delta region of Nigeria, children are forbidden from eating meat and eggs. They belief these essential food items are expensive and if children are reared on such expensive foods, they will grow up to steal in order to maintain the expensive food habit they have acquired [5]. Liver as meat is denied children, as elders in this region also claim it causes abscess in the liver of children. Children's denial of such dietary protein could lead to a depletion of the body's protein and consequently, the ability to maintain body tissues and sustain growth is lost and this causes protein-energy malnutrition [6].

This study therefore, attempts to correlate the degree of food prejudice and beliefs to the nutritional status of children using the ABCD method of assessment.

MATERIALS AND METHODS

Subjects: Four hundred and twenty-four children between the ages of 1-8years and whose parents uphold (n=210) and do not uphold (n=214) the cultural beliefs and prejudice that restrict nutrient intake by their children, were selected at random from rural communities and urban centres in Delta State, Nigeria. Informed consent was sought and obtained from parents who were also interviewed in order to gather socio-economic and demographic information. Based on parents' attitude to cultural beliefs and practices that forbid children's intake of adequate proteins, the subjects were grouped into two: test children (whose parents uphold the cultural practices that restrict children's protein intake) and control children (whose parents do not uphold such cultural beliefs).

Permission to perform the study in each community was given by the village head and the research was approved by our Faculty's Bioethnics and Research Committee.

Collection of Specimens: The normal process of vene puncture with the aid of a sterile hypodermic syringe and needle was used. Two millimeters of fasting whole blood was collected into plain sterile bottles and centrifuged at 1,200 x g for 5 minutes at room temperature to get approximately 1.0ml of serum. The serum obtained was stored frozen in bijou bottle and analyzed within 48 hours of collection.

Sample Analysis: The Biuret method described by Gornall, *et al*. [7] was used to determine the serum total protein. For albumin, the Doumas *et al*. [8] method was used. While, the Urease method [9] was utilized in the analysis of serum urea. And for creatinine, the modified Jaffe method [10] was used.

The already prepared, commercial test kits containing the reagents used for these assays were supplied by Teco Diagnostics, California, U.S.A.

Anthropometrical Measurement: The children's heights were measured by standard calibrated meter rule to the nearest 0.1cm. Arm and head circumference were determined by measuring tape. Weight was taken by bathroom weighing scale (BR-9011:HANA LTD) to the nearest 0.5kg.

Statistics: Paired, two-tailed students t-test was used to determine statistical significance between the test and control groups. Differences between the biochemical parameters were considered significant at the 5% probability level. SPSS (version 7.5) was used.

RESULTS

The results obtained from the investigation are summarized in Table 1. Parents of the test children were illiterate, rural dwellers with low economic power. However, the parents of the control children had no respect for the culture that prohibits intake of essential nutrients by their wards. In contrast, these latter parents were educated, urban dwellers with enhanced economic status. Thus, illiteracy and poverty may be partly responsible for the inclination to superstitious beliefs that rob children of essential nutrients for proper growth and development.

The anthropometric measures (height, weight, arm and head circumference) for the control subjects were all significantly higher ($P<0.05$) when compared with the aged-matched mean value for the test subjects. The changes in the biochemical assessments (serum total protein, serum albumin and serum urea) were similar in pattern to that observed for the anthropometric measures. Diet history revealed deficiency of protein

Table 1: Socio-demographic information and nutrition parameters obtained from children

	Cultural beliefs and prejudice restricting children's nutrient intake			
	Upheld		Not upheld	
Age (yr)	1-4	5-8	1-4	5-8
No. of subjects (n)	103	107	109	105
Settlement				
Rural	68	76	-	-
Suburb	35	31	53	61
Urban	-	-	56	44
Education of Parents				
None	53	47	-	-
Primary	44	39	7	11
Secondary	6	21	58	62
Tertiary	-	-	44	32
Household income (N)/month				
<10,000	63	69	-	-
10,000-49,999	29	32	8	12
50,000-99,999	11	6	66	73
100,000 and above	-	-	35	20
Nutrition Parameters (ABCD)				
Anthropometric Measurements				
•Height (cm)	73.5±5.8	97.4±4.5	98.5±3.5*	129.2±3.6*
•Weight (kg)	13.5±1.8	23.4±1.5	21.5±1.3*	31.2±1.9*
•Arm circumference (cm)	10.0±1.4	20.3±1.2	17.8±1.4*	26.7±1.6*
•Head circumference (cm)	34.5±1.8	51.2±2.0	52.0±2.2*	57.3±2.1*
Biochemical Assessments				
•Serum total protein (g/L)	35.4±3.6	44.1±3.2	64.1±2.8*	78.3±3.2*
•Serum albumin (g/L)	26.2±1.7	27.8±1.5	45.6±1.7*	47.2±2.1*
•Serum urea (mmol/L)	1.70±0.20	2.20±0.20	3.50±0.80	3.70±0.70
•Serum creatinine (mmol/L)	0.09±0.02	0.04±0.01	0.05±0.01	0.07±0.01
Clinical Examination				
•Brittle hair	77	69	4	2
•Moon face	65	57	2	1
•Rough,dry and wrinkled skin	98	88	5	4
•Motled teeth	101	104	6	5
•Angular chelitis	89	71	3	2
Diet History of Previous Day				
•Adequate in protein	-	-	31	36
•Fairly adequate in protein	2	5	74	65
•Poor in protein	86	91	4	4
•Very poor in protein	15	11	-	-
Gomez classification of malnutrition**				
Normal	5	16	106	104
GradeI (mild malnutrition)	43	57	3	1
GradeII (moderate malnutrition)	49	33	-	-
GradeIII (severe malnutrition)	6	1	-	-

*Significantly higher when compared with the other (upheld) aged-matched mean value.

**Method described by Onigbinde (15)

intake (as judged by RDA) among the test children and the texture and appearance of their skin, hair, face and teeth were evidence. Six of the test children between 1-4 yrs had severe malnutrition, but no grade II or III malnutrition among the control children.

DISCUSSION

The dietary nutrient (protein) intake of majority of the test subjects studied was poor. 96.7% of the test and 3.7% of control children had poor intake of dietary proteins and this identified deficiency appears to affect the anthropometric values. 88 and 76% of test children between the age ranges of 1-4 and 5-8 years, respectively, had a reduced arm circumference for their age. The arm circumference for age has the greatest sensitivity and specificity in identifying malnutrition [11]. The biochemical analysis showed a significant ($P<0.05$) mean decrease in serum protein and urea levels of the test subjects relative to the control children. The mean decrease in urea concentration is attributed to inadequate supply of protein in diet, since urea synthesis is dependent on protein intake [12]. Riches and Hobbs [13], reported that children having marasmic-kwashiokor, have considerable lower total protein and serum albumin values than marasmic children. However, the reduction in serum albumin level has been demonstrated to be a relatively late event in protein deficient diseases, hence there was a significant decrease in serum albumin of the test subjects which may be due to the highest grades of malnutrition reported (Table 1). A drop in protein intake is first indicated by the reduction in urea synthesis [12]. This could account for the observed low level of urea in the serum of the test subjects. Serum creatinine levels are not affected by changes in diet or the rate of protein catabolism [14], as such, there was no marked decrease in serum creatinine levels of the test subjects relative to the control individuals. The physical examination of the hair, teeth, face and skin of the test population, showed abnormalities possibly induced by poor feeding.

The results of this investigation are indicative of dietary nutrient (especially protein) deficiency. Undernutrition in childhood can also weaken resistance to infection and so, many children in developing countries like ours are dying from the combination of malnutrition and infection [15]. On Thursday, the 22nd of June, 2006, a National Newspaper-Vanguard (p41) reported that Nigeria has launched the first-ever report card on nutrition tagged 'Progress for Children". The paper also stated that despite major achievement in the areas of universal salt

iodization, vitamin A supplementation and vitamin A food fortification, Nigeria is among the 10 countries in the world with the largest population of underweight children. However, the signs of malnutrition could be non specific, since they could be caused by multiple nutrient deficiencies or by non-nutritional factors. Nevertheless, it is thus, evident from the present study that majority of the test subjects were not provided with sufficient nutrients and various building components needed for growth and food prejudice and prohibitions are strongly implicated, though others may include poverty and illiteracy. Thus, economic, social and political changes that lead to an increase in the number of poor, illiterate people may tend to intensify the problem of undernutrition. Therefore, we advocate that enlightenment campaign strategies be initiated to educate the lay public on the dangers of strong adherence to food taboos that reduce the dietary nutrient supply to children in Nigeria and beyond. We also suggest that government should not implement programmes that would further increase the poverty and illiterate levels, as this is capable of worsening the already existing problem of undernutrition among children especially.

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