Volume : 2 | Issue : 9 | Sept 2013 • ISSN No 2277 - 8160

Research Paper | Home Science

Assessment of the Micronutrient and Protein Consumption of Adolescent and Adult Inhabitants of Awgbu, A Rural Community of Anambra State, Nigeria

Madukwe E.U.	Department of Home Science, Nutrition and Dietetics, University of Nigeria, Nsukka, Nigeria
Edeh, R.I.	Department of Home Science, Nutrition and Dietetics, University of Nigeria, Nsukka, Nigeria
Nwankiti N.	Department of Home Science, Nutrition and Dietetics, University of Nigeria, Nsukka, Nigeria

ABSTRACT

Objective: This study assessed the intakes of vitamins A and C, iron and protein among adolescent and adult inhabitants of Awgbu community in Orumba North Local Government Area of Anambra State, Nigeria. .

Methodology: A 3 – day weighed food intake method was employed to assess the iron, vitamin A, protein and vitamin C intake of thirty-six households randomly selected out of the forty-eight households in the community. The levels of iron, protein, vitamin A and vitamin C consumption obtained was compared with FAO/WHO recommendations for adolescents (10 – 12 years, 13 – 15 years and 16 – 19 years) and adults (above 19 years).

Results: The mean dietary intake of iron for adolescents aged between 10 and 12 years ranged between 11.71 and 12.63mg, 13 – 15 years (17.11 – 19.49mg), 16 – 19 years (17.22 – 21.33mg) and for adults above 19 years (23.94 – 26.23mg). Vitamin A consumption for adolescents between 10 and 12 years ranged between 689.99 – 1318.64mgRE, 13 – 15 years (1639.17 – 2377.57mgRE), 16 – 19 years (1577.72 – 1593.48mgRE) and for adults above 19 years (3177.83 – 4122.15mgRE). The daily dietary protein intake of adolescents between 10 and 12 years ranged between 36.93 - 52.68g, 13 – 15 years (44.09 – 46.18g), 16 – 19 years (49.00 – 58.35g) and for adults above 19 years (58.35 – 79.97g). Daily dietary ascorbic acid consumption for adolescents between 10 and 12 years was between 25.96 and 28.85mg, 13 – 15 years (36.05 – 39.88mg), 16 – 19 years (41.06 – 41.16mg) and for adults above 19 years (23.94 – 26.23mg).

Conclusion: The consumption of iron among adolescents and adults in Awgbu community was inadequate except for adolescent and adult males above 15 years old. Vitamins A and C consumption was adequate except for the adult females who had an inadequate consumption of vitamin C. Protein intake was also adequate for all age groups except for adolescents between 13 and 15 years old. Dietary modification and diversification were therefore recommended as ready tools for addressing the nutritional imbalances observed especially for the synergists of vitamin A and vitamin C inorder to improve the bioavailability of the vitamins.

KEYWORDS: Assessment ,Iron, Vitamin A, protein, vitamin C

INTRODUCTION

Vitamins and minerals are considered essential for physical and mental development, immune system functions and various metabolic processes (1). Deficiencies of iron and vitamin A are the most widespread form of micronutrient malnutrition with public health consequences.

Iron deficiencies and its anaemia affect more than 3.5 billion people in the developing world (2). In Nigeria, 20% of the children studied in 12 states selected in the agro-ecological zones were iron deficient while another 8% had iron store depletion. (3). The national prevalence of low serum retinol (< 20 ug/dl or 0.74 mol/l) was 28.1%, indicative of a severe public health problem (4). The observed risk factors for this low serum retinol included health zone and places of residence, occurring higher in rural than urban areas. Earlier, the 1993 national micronutrient survey in Nigeria concluded that vitamin A deficiency is a severe public health problem in the country (5).

Unfortunately, most Nigerian meals traditionally consumed are based on roots, tubers and vegetables. Meat and fish are rarely consumed because of affordability. There is also an improper combination of these roots, tubers and vegetables which abound in Nigeria. Consequently, micronutrient deficiencies still occur as a major nutritional problem affecting mostly pregnant women, lactating mothers, infants and children under 5 years of age. At times, these foods which have high micronutrient levels are rarely consumed by the people due to ignorance on their nutritional potentials.

The elimination of vitamin A and iron deficiencies as public health problems have been identified as a high priority in international nutrition. The modalities recommended include promoting prolonged breastfeeding, dietary modification, fortification and supplementation (6). This study is therefore aimed at assessing the iron, vitamin A, protein and vitamin C consumption of inhabitants of Awgbu Community in Orumba North L.G.A of Anambra State, Nigeria.

MATERIALS AND METHODS

Study Area: The study was carried out in Awgbu Community, Orumba North L.G.A of Anambra State, Nigeria. The climatic conditions of the town include moderate rainfall, moderate temperature and humidity that fluctuate between the 2 major seasons (wet and dry) in Nigeria. The major occupation of the people are farming and trading and their major staple foods are cassava, yam, maize, plantain, palm fruit, bread fruit, fruits and vegetables.

Sample Selection: Thirty six families were randomly selected out of the total number of forty eight families in Awgbu community.

Data Collection: A 3-day (2 weekdays and 1 weekend day) weighed food intake of the 36 randomly selected families was conducted to ascertain the intake of iron, vitamin A, protein and vitamin C of the respective family members. The food consumption table (10,11) was used to calculate the nutrient (iron, vitamin A, protein and vitamin C) composition of the respective food portions, in-between meals and snacks consumed by the members of the families within the period of study.

Data Analysis: The data obtained were categorised and tabulated. The values of iron, vitamin A, protein and ascorbic acid consumed by individual members of the families were compared with the FAO/WHO (1,9) recommendations. Percentages, means and standard deviation were used to analyse the data collected.

RESULTS

Table 1: Mean intake of iron by children, adolescents and adults compared with FAO/WHO (1) recommendation per day.

	Children (10-12yrs)		Adolescents (13-15yrs)		Adolescents (16-19yrs)		Adults (>19yrs)	
	M	F	M	F	M	F	M	F
FAO/WHO Recommendation (mg)	16.00	16.00	24.00	27.00	15.00	29.00	15.00	29.00
Mean iron intake (mg)	12.63	11.71	19.49	17.11	17.22	21.33	26.23	23.94
% FAO/WHO Recommendation	78.94	73.19	81.21	63.37	114.80	79.00	174.87	82.55

Table 1: Shows the mean iron intake of children, adolescents and adults of both sexes

compared with the FAO/WHO recommendations. Only the adolescent males aged between 16-19 years met the FAO/WHO recommendation of iron intake for their age categories and sex. The mean iron intake of the adult males were almost twice the FAO/WHO recommendation. The mean iron intake of the adolescent girls aged 13 – 15years was a little more than half of the FAO/WHO recommendation. For all age groups, the consumption of the males was more than those of the females.

Table 2: Mean intake of vitamin A by children, adolescents and adults compared with FAO/WHO (1) recommendation per day.

	Children (10-12yrs)		Adolescents (13-15yrs)		Adolescents (16-19yrs)		Adults (>19yrs)	
	M	F	M	F	M	F	M	F
FAO/WHO Recommendation (mgRE)	500.10	500.10	600.00	500.10	600.00	500.10	600.00	500.10
Mean Vitamin A intake (mgRE)	689.99	1318.64	2377.57	1639.17	1593.48	1577.72	3177.83	4122.15
% FAO/WHO Recommendation	137.97	323.66	396.26	327.76	265.58	315.48	529.64	824.26

The mean intake of vitamin A by children, adolescents, and adults compared with FAO/WHO recommendations shown in table 2 indicated that all the age groups met and even consumed more than the FAO/WHO recommendation of vitamin A for their age group and sexes. The adult females aged above 19years consumed more than 8 times their FAO/WHO recommendation.

Table 3: Mean intake of protein by children, adolescents and adults compared with FAO/WHO recommendations per day.

	Children (10-12yrs)		Adolescents (13-15yrs)		Adolescents (16-19yrs)		Adults (>19yrs)	
	M	F	M	F	M	F	M	F
FAO/WHO Recommendation (g)	34.00	36.00	47.00	56.00	42.00	45.00	49.00	45.00
Mean Protein intake (g)	52.68	36.93	44.09	46.18	49.00	58.35	79.97	58.35
% FAO/WHO Recommendation	152.90	102.50	93.80	82.46	116.67	129.67	163.20	129.67

Table 3 shows the mean protein consumed by children, adolescents and adults compared with the FAO/WHO recommendations. The results indicate that the levels of protein consumption of all the age groups was above the FAO/WHO recommendation except for the adolescents in the age group of 13 – 15years and the adolescent males within the age group of 16 – 19years. The intake of the male children within the age group of 10 – 12years and adult males above 19 years of age were more than 50% above the FAO/WHO recommendations.

Table 4: Mean ascorbic acid consumed by children, adolescents and adults compared with FAO/WHO (9) recommendations per day.

	Children (10-12yrs)		Adolescents (13-15yrs)		Adolescents (16-19yrs)		Adults (>19yrs)	
	M	F	M	F	M	F	M	F
FAO/WHO Recommendation (mg)	20.00	20.00	20.00	30.00	30.00	30.00	15.00	29.00
Mean Ascorbic acid intake (mg)	25.56	28.85	39.88	36.05	41.06	41.16	26.23	23.94
% FAO/WHO Recommendation	127.80	144.25	132.93	120.17	136.56	159.20	174.87	82.55

Table 4 shows the mean ascorbic acid consumed by children, adolescents and adults compared with FAO/WHO recommendations and indicates that all age groups and sexes consumed levels of ascorbic acid above the FAO/WHO recommendations. The female adolescents within the age group of 16-19years consumed levels of ascorbic acid more than 50% above the FAO/WHO recommendation while the adult males and females above 19years of age consumed more than double of the FAO/WHO recommendation for their age group.

DISCUSSION

The food intake of the families assessed showed an inadequate intake of iron especially among the females. This is critical considering the implication of the enormous iron requirement by the female gender. This result agrees with previous research findings by Enwere (7) and could be as a result of the low socioeconomic status of the rural women who can hardly afford the consumption of meat and other ready sources of iron. Hence, they must have to rely on plant sources of iron which is known to have a low bioavailability status (8). However, the effects of this low iron consumption may not be very pronounced considering the ample consumption of ascorbic acid among the families. Ascorbic acid is known to improve iron absorption (7).

Vitamin A consumption among the families was adequate. This is because, Awgbu is a rural community of mostly farmers. Hence, there would hardly be any meal consumed in the community without an ample supply of palm oil and fresh green leafy vegetates which are good sources preformed of vitamin A (5,8). However, the bioavailability of the adequate consumption of vitamin A in the community raises another concern considering the level of consumption of protein which though was adequate for the children and adults, remained inadequate for the adolescents especially the males. Protein plays vital roles in the intracellular transport and mobilisation of vitamin A.

CONCLUSION

The consumption of iron among adolescents and adults in Awgbu community was inadequate except for adolescent and adult males above 15 years old. Vitamins A and C consumption was adequate except for the adult females who had an inadequate consumption of vitamin C. Protein intake was also adequate for all age groups except for adolescents between 13 and 15 years old. Though the iron consumption among the population was not adequate, the relative adequacy of ascorbic acid consumption suggests a high bioavailability of the consumed iron and should therefore stem the incidence of anaemia within the population. However, the observed nutritional problem/imbalances can be addressed through dietary modification and diversifications.

RECOMMENDATION

There should be more nutritional enlightenment of the people on the proper combination of food to achieve adequate nutrition and the importance of an adequate consumption of fresh fruits and green leafy vegetables in the diet. Dietary diversification and modification which is a home – bred practical tool for addressing nutritional inadequacies should be championed especially among rural communities. Wholistic nutrition should be pursued as a lasting solution to the nutritional problems of every society.

REFERENCES

1. FAO/WHO (2002): Requirement of Vitamin A, Iron, Folate and Vitamin B12. Report | Of a Joint FAO/WHO Expert Committee on World Food Security and Nutrient | Requirement. Pp 55-57. | 2. WHO (2000): Global Database on Child Growth and Malnutrition. WHO/NHD/00.3. | Geneva. Pp 620-625. | 3. IITA (2004): International Institute of Tropical Agriculture Annual Report. IITA Ibadan | Nigeria. Pp 170-176. | 4. WHO (1995): Global Prevalence of Vitamin A Deficiency. Micronutrition Deficiency | Information System. WHO Working Paper. Geneva, pp. 720-721. | 5. IVACG (1997): Report of the XVIII/International Vitamin A Deficiency IVACG, | Washington D.C. USA. Pp. 21-29. | 6 ACC/SCN (1993): A Report Based on the ACC/SCN Consultative Group Meeting on | Strategies for the Control of Vitamin A Deficiency. Geneva. Pp 55-59 | 7. Enwere, N.J. (1998): Foods of Plant Origin, Afro-Orbis Publications Ltd Nsukka Nigeria. | Pp 10-24. | 8. Ene-Obong, H.N. (2001): Eating Right. A Nutrition Guide. University of Calabar Press. | Calabar. Pp 93-96. | 9. WHO (1989): Requirement of Ascorbic Acid, Vitamin D, Vitamin B12, Folate and Iron. | Report of a Joint FAO/WHO Expert Group. Technical Report Series No. 952 | pp 46-47. | 10. Platt, B.S.(1975): Table of representative values of foods commonly consumed in | tropical countries. Medical Research Council Report Series No 302, Her Majesty's | Stationary Office, London. | 11. Food Basket Foundation Publication Series (1995): Nutrient Composition of Commonly | eaten foods in Nigeria; raw, processed and prepared. Oguntona, E.B. and | Akinyele, I.O.(eds). OBT Printing ventures, Ibadan. |