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Assessment of the Nutritional Status of Sickle Cell Patients in Ijebu-Ode, Ogun State, Nigeria

[1]Sobo, [1]Racheal Abisola, [1]O. Olusanya Joseph and [2]O. Keshinro Oluremi
[1]Unit of Home Economics, Department of Vocational and Technical Education,
Tai Solarin University of Education, Ijebu-Ode, Nigeria
[2]Department of Human Nutrition, College of Medicine, University of Ibadan, Nigeria

Abstract: The study assessed the nutritional status of 75 Sickle Cell Patients (who pay preliminary visit to the Sickle Cell outpatient clinic) at the Ogun State Hospital, Ijebu-Ode. Anthropometric indices were obtained to determine stunting, wasting and underweight for young patients and Body Mass Index (BMI) for the adults. Nutrient intake was estimated by 24 h dietary recall and was compared with WHO recommendation. The respondents comprised of 32 (34%) adults. The mean Packed Cell Volume (PCV) for the female respondents was 20.5%, which was higher than the males, (19.4%). The mean Body Mass Index (BMI) value for the adult patients was 17.66±2.41 and this implied that (averagely), the subjects fell within the category of Grade I (GI) underweight. The nutrient intake of the male patients was not statistically ($p>0.05$) significantly different from the females'. The study revealed that the respondents' nutrient consumption was poor.

Key words: Nutritional assessment, sickle cell disease, body mass index, dietary recall

INTRODUCTION

The normal red blood cells are round like doughnuts and they move through small blood tubes in the body to deliver oxygen. In sickle cell disease, the red blood cells do not live as normal red blood cells which are 120 days, but they live normally for about 16 days, they also become still, distorted and have difficulty passing through the body's small blood vessels (Lewis and Muller, 2004). Anani *et al.* (2004) observed that in West Africa, Sickle Cell Disease (SCD) has many distinctive features such as highest prevalence of carriers and highest mortality rate. Few people have rational knowledge about its pathophysiology and many health care providers are not aware of the adequate management of Sickle Cell Disease (SCD) especially during acute episodes. According to Lewis and Muller (2001) extra calories are needed by those affected with Sickle Cell Disease (SCD), in order to fuel their red blood cell production to replace the damaged sickled ones. Sickle cell diseased patients also need other nutrients such as adequate amount of folic acid for red blood cell formation and these can be found in foods such as grains fruits, leafy green vegetables, Wardlaw and Kessel (2002) stated that folate deficiency generally results from low intakes, inadequate absorption, which is often associated with alcoholism, increased requirement such as in the case of pregnancy, sickle cell disease. It is important for health care givers and nutritionists to be aware of the nutritional status of sickle cell respondents in order to be able to manage the condition effectively. Singhal *et al.* (2002) described nutritional health of a person as being determined by anthropometric measurement, biochemical measurements of nutrients, clinical (physical) examination and dietary analysis as nutritional status. The African region has the highest estimated prevalence of stunting and also has the lowest rate of improvement (Gardner and Dolan, 2002). Bello *et al.* (2002) carried out a research on the nutritional status and the retrospective attainment of menarche in homozygous (SS) sickle cell respondents. The result showed that there was a 2.97 years delay in the attainment of menarche for the Nigerian female sickle cell patient and that the anthropometric indices were low. This is a further research to asses their nutritional status using anthropometric indices, hematological and food consumtion methods.

MATERIALS AND METHODS

The study was carried out using sickle cell respondents, male and female of all age groups who usually come for preliminary visit at the sickle cell outpatient department of the Ogun State Hospital, Ijebu-Ode.

Corresponding Author: O. Olusanya Joseph, Unit of Home Economics, Department of Vocational and Technical Education, Tai Solarin University of Education, Ijebu-Ode, Nigeria

Purposive sampling technique was used and this included all clients that came for preliminary visit to the clinic.

Permission for recruitment: To obtain necessary information permission from the Medical Director and the head of the Sickle Cell outpatient department of State Hospital, Ijebu-Ode, Ogun State was sought and consent was gained from the patients. For the purpose of this study, 75 clients which comprised of 32 children, 25 adolescents 18 adults and a 45 year-old were involved in the study.

Administation of questionnaire: The instrument used to obtain information was a structured and pre-tested questionnaire which included different sections for demographic data, food frequency, food habits and 24 h dietary recall. The questionnaire was self administered by the researchers, while the children under 5 years were interviewed with the assistance of their mothers.

Anthropometric parameters: The weight and height of the children were determined using bathroom weighing scale and a stadiometer respectively. These were measured to the nearest 0.1 kg and centimeter respectively. Information about the patients' packed cell volume was retrieved from their case notes. The anthropometric data for the adults were compared with World Health Organisation's (WHO) reference standard while the foods consumed in the previous 24 h were recalled by respondents and the nutrients calculated and compared with World Health Organisation's (WHO) recommendation.

Statistical analysisi of data: Data were analyzed using S.P.S.S 10.0 and results were presented in simple frequency tables. T test was used to test the level of significance of nutrient intake of the male and female respondents at 5% level.

RESULTS

The results of this study are presented in Table 1-5. Seventy five people with Sickle Cell Disease (SCD) were studied to assess their nutritional status. The respondents comprised of 32 (43%) children, 17 (23%), adolescents and 26 (34%) adults, (Table 1). None of the respondents was above 45 years of age. The Packed Cell Volume (PCV) for the male and female respondents was 19.4±40% and 20.5±5.14%, respectively as against the normal value of 40-50 and 77.4% (Walsh, 2002) (Table 2). This shows that the anaemia level of the respondents was very high. The anthropometric indices for both the children and the adult respondents is shown in Table 3 and for the adult respondents, only 9(35%) of them had normal Body Mass Index (BMI) while the rest were underweight (Table 4).

From the study, the intakes of vitamin C, folic acid and vitamin B12 were lower than WHO recommendation (Table 5) and according to Lewis and Muller (2004) people with Sickle Cell Disease (SCD) need extra folic acid, in order to produce red blood cells more quickly. There was no statistically ($p>0.05$) significant difference between the nutrient intake of the male and female respondents.

Table 1: Age distribution of the patients

Category	Range (Yrs)	F	(%)
Children	1-11	32	43
Adolescent	11-19	17	23
Adult	19-45	26	34
Total		75	100

Table 2: Summary description of the respondents' Packed Cell Volume (PCV)

Sex	F	Range	Mean	Variance
Male	20	11-33	19.4±4.90	24.01
Female	55	10-34	20.5±5.14	26.43
Total	75	11-34	19.95±3.70	13.6

Table 3: Summary of the anthropometric indices for the patients

Category		Mean
Children and	Weight (kg)	24.86±9.65
Adolescents	Height (cm)	120.96±23.40
	Z score for stunting: <-2s.d	-1.42±1.94
(n=49)	Z score for wasting: <-2s.d	0.69±1.53
	Z score for underweight: <-2s.d	-0.80±1.42
Adults	Weight (kg)	45.60±7.90
(n=26)	Height (m)	1.60±0.10
	BMI [w/h(m^2)]	17.66±2.41

Table 4: Body Mass Index (BMI) distribution of the patients

Descripttion	WHO (1997) value	Range of value for respondents	F	(%)
GIII underweight	<16.5	14.18-15.81	8	31
GII underweight	16.5-17.4	16.54-17.30	6	23
GI underweight	17.5-18.4	17.72-17.79	3	12
Normal	18.5-24.9	18.75-22.66	9	35
Total			26	100

WHO (1997). BMI range of values WHO/NCHS/CDC as reference standard

Table 5: Nutrient intake as percentage (WHO, 1989) RDA for adult patients

	Male (n = 6)			Female (n = 20)		
Nutrient	RDA	Intake	Intake (%)	RDA	Intake	Intake (%)
Energy (Kcal)	3000	2674.1	87.1	2200	2474.1	121.1
Protein (g)	59	56.1	95.1	47	44.6	95.0
Vitamin C (g)	60	12.2	20.3	60	13.9	23.2
Folic acid [Folate] (µg)	200	36.1	18.0	200	59.5	14.6
Vitamin B12 (µg)	2.0	1.2	60	2.0	0.9	46.0

DISCUSSION

The high level of anaemia among the respondents showed that confirms the previous finding that haemolytic anaemia is one of the clinical features of Sickle Cell Disease. (Wardlaw and Kessel, 2002). The result of the anthropometric indices for the adult revealed that only 9(35%) of them had normal Body Mass Index (BMI) while the rest were underweight. This probably means that the metabolism and utilization of the nutrients are impaired. The intakes of vitamin C, folic acid and vitamin B12 were lower than WHO recommendation and according to Lewis and Muller (2004) people with Sickle Cell Disease (SCD) need extra folic acid, in order to produce red blood cells more quickly. Their vitamin C deficiency may probably be due to poor fruit consumption, since the amount from other food sources, (spinach, amaranths and other green leafy vegetables. etc.,) are subject to heat treatment which destroys vitamin C before consumption. The low intake of vitamin B12 may be associated with poor intake of animal source protein. In order to compensate for these low nutrient intakes, the clinic made arrangement to administer supplements to the patients on monthly basis so as to prevent symptoms arising from folic acid deficiency.

CONCLUSION

Haemolytic anaemia is one of the major physiological problems of Sickle Cell Disease. This is confirmed in the study among the sickle cell disease patients in Ijebu-Ode area of Ogun State, Nigeria. Stunting and underweight were prevalent among the children and adult respondents respectively and their nutrient intake (folic acid, vitamin B12 and vitamin C) were found to be lower than the WHO (1989) recommendation.

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