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Status and CD4 Cell Counts in Refugee Patients with HIV/AIDS Receiving Antiretroviral Therapy in Egypt

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Abstract: A nutritional assessment can detect any abnormal finding early so that nutritional assessment conducted for 50 HIV/AIDS refugee out patients from different nationalities (Sudan, Eretria, Ethiopia, Syria, Iraqi, Somali and Zimbabwe) in Cairo Refuge Egypt Clinic at Zamalikwhich were divided into 2 groups; CD4 < 200cells/µL group and CD4 > 200 cells/µL group to Study the factors that might influence the nutritional status and detect the nutritional problems which related to HIV/AIDS refugee patients. Anthropometric measurements (weight, height and BMI), food intake and laboratory investigation were calculated. The result showed that daily intake of macronutrient and micronutrient for both groups were low but CD4 < 200 cells/µL group was lower than CD4 >200cells/µL group according to DRI. The mean value show that CD4 <200cells/µL group was underweight but CD4 >200cells/µL group was through normal range. Almost, patients of both groups were Sudanese. The majority of studded sample had black skin. The majority of the subjects were single female (64.3% and 36.4%) of the CD4 < 200cells/µL and CD4 > 200 cells/µL groups respectively. Patients which infected with HIV through sexual relationship represented all CD4 < 200cells/µL group and 77.3% of CD4 > 200 cells/µL group.May patients of sample exposed to violence and raping in traffic from their countries to another one or due to sexual abuse and poverty. Lack of job opportunities, more than 75% of women in both groups which were jobless, even job of working women were inconsistent jobs while their current job did not always provide a good

income. Almost of CD4 < 200cells/μL group lived in unhealthy home which represented 78.6% of this group compared with other group (45.5%) which has negative effect in their health . Almost of tested sample suffering from health problems as GITdisease, but found more in CD4 < 200 cells/μL group. The gastrointestinal side effects of ARVs drugs (nausea, vomiting, or diarrhea i.e.,) can have a significant effect on dietary intake among HIV-positive individuals Anemia is more common in CD4 < 200 cells/μL group, findings through investigations, decreased in haemoglobin and haematoctate levels among this group whereas most of laboratory tests of CD4 >200cells/μL group were within normal values. calories intake were less than DRI for both groups which were 45.24and 60.61% of DRI for CD4 < 200cells/μL and CD4 > 200 cells/μL groups respectively although HIV patient who has no symptoms requires 10% more energy above the level recommended for a healthy non-infected person. Daily intakes in all minerals for both groups were less than DRI. But CD4 < 200cells/μL group has worst situation than other group. The percentages of protein intake of CD4 > 200cells/μL group was 75.35% more than CD4 < 200cells/μL which was 31.68% when compared with DRI and major source of protein for CD4 < 200cells/μL group was plant proteins. The consumption of vegetables and fruits was very low in patient‘s diet for both groups.

Key words: Nutritional assessment, HIV/AIDS patients, Refugee, food intake, anthropometric measurements.

Introduction

HIV stands for the Human Immunodeficiency Virus. HIV is the virus that causesAcquiredImmune Deficiency syndrome (AIDS) . The immune system is the body's defense system. While many viruses can be controlled by the immune system, HIV targets and infects the same immune system cells that are supposed to provide protection against illnesses **(CDC, 2017)**.

HIV is most commonly transmitted through sexual intercourse; infection can also occur from mother-to-child or through contaminated sharp instruments e.g. needles used for drugs or knives used for circumcisions**(Global Service Corps, 2011)**.

AIDS stands for Acquired Immune Deficiency Syndrome. AIDS is the most advanced stage of HIVinfection. HIV causes AIDS by attacking CD4 cells. When the immune system loses too many CD4

cells, aperson is less able to fight off infection, and can develop serious, often deadly, infections. These arecalled opportunistic infections (OIs) **(CDC, 2017b)**.

A person may also be diagnosed with AIDS if he is HIV-positive, and has a CD4 cell count below 200cells/μL, even if he does not have an opportunistic infection. The most commonly used HIV tests involve detection of HIV antibodies - the substances the body creates in response to becoming infected with HIV. There are tests that look for HIV genetic material and proteins directly **(CDC, 2017)**.

ARVs support sustained cessation of HIV replication (i.e., therapy stops the virus from making copies of itself), often resulting in undetectable levels of plasma viral load which in turn is associated with reduced rates of hospitalization, opportunistic infections, progression to AIDS, and death **(Roca, Gomez, &Arnedo, 2000; Pradier *et al*., 2001 and Lima *et al.*, 2009)**.

However, side effects such as nausea and vomiting, as well as metabolic complications involving unbalanced glucose and lipid metabolism, have been associated with the use of certain ARV drugs and can lead to compromised nutritional status **(Shevitzand Knox, 2001)**.
The relationship between infection and nutrition has been known since the early 1900s. Malnutrition and HIV have similar effects on the immune system, including reduced CD4 and CD8 T-lymphocyte numbers and general bactericidal properties (i.e., a reduced ability of the body's immune system to identify and kill infectious agents) **(Chandra, 1999andSuttajit, 2007)**.

Low or decreased income is also related to individual or family location of residence, which may impact food accessibility. Food insecurity is a significant problem for people living with HIV in the United States **(Weiser *et al.*, 2009)** and can result in outcomes that are especially problematic for this population **(Campa *et al*., 2005; Weiser *et al*., 2008 and Weiser, *et al*. 2009andParker, *et al* 2010)**.

Follow up and nutritional intervention studies are needed for evaluation of the efficiency of nutritional therapy for modifying the risk of morphological and metabolic abnormalities associated with the use of antiretroviral therapy among HIV-infected persons. Once the efficiency of this type of intervention has been proven, it can be incorporated into the set of integrated care actions available for people living with HIV/AIDS **(Leyes *et al.*, 2008)**.

Subjects and Methods:

I-Research design:

A retrospective design was used in the study.

II- Sample site:

Subjects for current study were chosen randomly for HIV/AIDS patients of refugee at Egypt Cairo Refugee Egypt Clinic currently taking ARV medications, they were adult female patients. The total sample size was 50 female patients. Their ages ranged between 20 - 60 years. These were divided into two groups depending on immunity cells called CD4: CD4 < 200cells/μL group and CD4 > 200 cells/μL.

III- Period of the study:

The present study started in Feb 2016 and ended in February 2018.

IV- Design of work:

- Before starting the field work an approval Cairo Refugee Egypt Clinics administration was asked.
- Interviews were held with HIV/AIDS patient using a questionnaire sheets which were designed to collect data concerned about food habits, attitudes, health status, and anthropometric measurements as follows:

1- Daily dietary data:

The 24 hours record and dietary history methods were used.

2-Assessment of nutrient intake from food consumption data:

Nutrient values were derived from standard reference tables (Food Composition Table for Use In the (Near East, 1982 and National Nutrition Institute Food Composition Tablesfor Egypt, 2006).

For each food, calculation were made of the contribution of food energy, protein, carbohydrate, fat, iron, calcium, phosphorus, sodium, potassium, zinc, magnesium, vitamin "A, D, E, C, B complex" and folate. The nutritive value of the diet was then compared with the calculated total of the **(DRI, 2002)** appropriate for the female individuals in the study. Estimation of the adequacy of nutrient intake was based on data of individual dietary intakes.

3-Anthropometric measurements:

The anthropometric measurements weight, height and body mass index were taken

4-The questionnaires:

Three forms of questionnaires were used:

a-Socio-economic characteristics:

The socio-economic characteristics data including education level, total income, foods sources were collected by questionnaire through interviews.

b- Health History:

Health history included current health complaints, signs and symptoms besides opportunistic infections and disease.

c- Food Habits:

Information about food habits including method of meals cooking, number of daily meals, snacks, salt, sugar preference and source of nutritional information.

5- Laboratory investigation:

CD4 blood test: The most important test to determine and evaluate the immunity status of patients and other laboratory tests to evaluate nutritional and health status of patients as white blood cells, red blood cells, hemoglobin, platelets, creatinine which refers to kidney function and SGPT which refers liver function.

6-Biological and biochemical procedures:

A- For HIV/AIDS patients requirement of calories raised by 10% more energy above the level recommended compared to healthy subjects, and protein raised by 50% also according to WHO recommendation for HIV/AIDS patients.**(Raiten *et al.*, 2005).**

B- Amino acids and fatty acids composition calculated as well as food gross composition using computer program of Statistical Food Unit, Faculty of Home Economics Menufia University.

C- Calories estimated according DRI (2002) to formula:

354 – (61.51age) + "PA" 1027 (9.36 weight + 726 Height).

D- Body fat calculated according to **Deurnberg *et al.*, (2007)** formula as follows:

Adult body fat % = (1.2 x BMI) + (0.23 x Age) – (10.8 x gender) – 5.4

Using gender of male = 1, female = 0

E- The predicted protein efficiency ratio (P–PER) was estimated by using the equation of the form according to **(Alsmeyer *et al.*, 1974)**

PER1 = - 0.684 +0.456 Leucine– 0.047 Proline.

PER2 = -0.468 + 0.454 Leucine- 0.105 Tyrosine.

PER3 = - 1.816 + 0.435 Methionine + 0.78 Leucine+ 0.211 Histadine– 0.944 Tyrosine.

F- Essential amino acid index (EAAI) was calculated based on the procedure of Oser (1959). The ratio value was taken from essential amino acid in the test protein relative to their respective amounts in whole egg protein.

I- A high degree of correlation between essential amino acid indexes (EAAI) and biological values was found. Form the EAA indexes; he derived an equation for calculating the biological value was derived. **(Oser, 1959)**: Biological value (BV) = 1.09 (EAAI) - 11.7

7-Statistical analysis and results:

1-The first step done in order to analyze the collected data were to tabulate all the raw values for each variable and for CD4 < 200cells/μL group and CD4 > 200 cells/μL group.

2-Means and standard deviations of each variable were calculated according to **Snedecor and Cochron (1972)**.The data were analyzed by computer using the Statistical Package for the Social Sciences (Version 22, IBM SPSS Inc., Chicago, Illinois).

Results and Discussion:

The results of Table (1) show the characteristics of the study sample.

With regard to nationality, it was found that the majority of patients from Sudan (57.1 and 72.7%) of CD4 < 200cells/μL and CD4 > 200 cells/μL groups respectively, While, Somalia and Iraqi group were free from HIV/AIDS patients for CD4 > 200 cells/μL but in group of CD4 > 200 cells/μL patients percentage from Zimbabwe was 4.5%.

For CD4 < 200cells/μL in Syria, Iraq, Somalia and Zimbabwe the same patient's percentage was (3.6%).

As for skin color, it could be observed that the black skin were (71.4 and 81.8%) of the CD4 < 200cells/μL and CD4 > 200 cells/μL groups respectively.

It was found that marital status (single, married and widow) were (64.3, 32.1 and 3.6%) respectively from CD4 < 200cells/μL group, but not found any case divorced within this group, whereas marital status of CD4 > 200 cells/μL group (single, married and divorced) were (36.4, 59.1 and 4.5 %) respectively but not found any case widow within this group.

From the result of Table (1) it may be noticed that possibly no relation found between family member and level of CD4.

Table (1): Frequency distribution and percentage of total sample according to their main characteristics

Variable		CD4 < 200cells/µL (N 28)		CD4 > 200 cells/µL (N 22)		P. Value
		Frequency	Percentage	Frequency	Percentage	
Nationality	Sudanese	16	57.1%	16	72.7%	0.832
	Eritrean	3	10.7%	2	9.1%	
	Ethiopian	5	17.9%	2	9.1%	
	Syrian	1	3.6%	1	4.5%	
	Iraq	1	3.6%	0	0%	
	Somali	1	3.6%	0	0%	
	Zimbabwe	1	3.6%	1	4.5%	
Skin color	Black	20	71.4%	18	81.8%	0.511
	White	8	28.6%	4	18.2%	
Marital status	Single	18	64.3%	8	36.4%	0.115
	Married	9	32.1%	13	59.1%	
	Widow	1	3.6%	0	0%	
	Divorced	0	0%	1	4.5%	
Room number	One room	25	89.3%	8	36.4%	.001**
	Two room	2	7.1%	12	54.5%	
	Three	1	3.6%	1	4.5%	
	Five	0	0%	1	4.5%	
Family member	1	5	17.9%	5	22.7%	.652
	2	1	3.6%	3	13.6%	
	3	7	25.0%	3	13.6%	
	4	4	14.3%	4	18.2%	
	5	4	14.3%	5	22.7%	
	6	3	10.7%	1	4.5%	
	7	1	3.6%	0	0%	
	8	3	10.7%	1	4.5%	

* Significant p < 0.05 ** Significant p < 0.01 *** Significant p < 0.001

B-<u>Socio-economic status:</u>

The results of Tables (2) and (3) reveal socio-economicstatus of the study sample.

With respect to the education level of patients and their parents, it was found that (53.6 and 36.4%) of CD4 < 200cells/µL and CD4 > 200 cells/µL groups respectively were Illiterate, in the same time (50 and 59.1%) of CD4 <

200cells/μL and CD4 > 200 cells/μL groups respectively had illiterate fathers. while (50 and 54.6%) of CD4 < 200cells/μL and CD4 > 200 cells/μL groups respectively had illiterate mothers.

For the patient's job, the higher percentages of the study sample were jobless (75 and 77.3%) of CD4 < 200cells/μL and CD4 > 200 cells/μL groups respectively.

With respect to patient's caregiver was (78.6 and 81.8%) of CD4 < 200cells/μL and CD4 > 200 cells/μL groups respectively hadn't caregiver. Moreover the patient had unhealthy home (78.6 and 45.5%) of CD4 < 200cells/μL and CD4 > 200 cells/μL groups respectively.

Table (2): Frequencydistribution and percentage of total sample according to Socio-economic status

Variable		CD4 < 200cells/μL (N 28)		CD4 > 200 cells/μL (N 22)		P. Value
		Frequency	Percentage	Frequency	Percentage	
Education level of patient	Illiterate	15	53.6%	8	36.4%	0.718
	Read &write	3	10.7	1	4.6 %	
	Primary	1	3.6	1	4.6 %	
	Preparatory	0	0%	1	4.6 %	
	Secondary	3	10.7%	4	18.2%	
	College	5	17.9%	6	27.3%	
	Post graduate	1	3.6	1	4.6 %	
Education level of father	Illiterate	14	50%	13	59.1%	0.903
	Read &write	1	3.6	1	4.5%	
	Primary	5	17.9%	4	18.2%	
	Preparatory	2	7.1%	1	4.6 %	
	Secondary	4	14.3%	1	4.6 %	
	College	2	7.1%	2	9.1%	
Education level of mother	Illiterate	14	50%	12	54.6%	0.895
	Read &write	1	3.6	2	9.1%	
	Primary	4	14.3%	3	13.6%	
	Preparatory	5	17.9%	3	13.6%	
	Secondary	4	14.3%	2	9.1%	
Pt. job	Servant	7	25%	5	22.7%	1.00
	Jobless	21	75%	17	77.3%	
Caregiver	Yes	6	21.4%	4	18.2%	1.00
	No	22	78.6%	18	81.8%	
Home specification	Healthy	6	21.4%	12	54.5%	0.020*
	Unhealthy	22	78.6%	10	45.5%	

* Significant p < 0.05

In respect to total income (Table 3), it was 858.93 pounds for CD4 < 200cells/µL groups and 902.27 pound per month for CD4 > 200 cells/µL groups, revealed no statistical significant difference; the results calculated non significance, for income, other income, pocket money, money expenses on medicine and duration of receiving ARVs.

Mean money expenses on food was about 483.93 pounds in case of CD4 < 200cells/µL which was significantly more for group, the later showed 361.36 pounds.

Table (3):Mean and standard deviation of total sample according to financial status

Variable	CD4 < 200cells/µL cells/mm3 Mean ± SD	CD4 > 200 cells/µL Mean ± SD	T-test
Income L.E.	708.93 ± 153.99	752.27 ± 234.25	0.435
Other income L.E.	150.00± 0.00	150.00 ± 0.00	-
Total income L.E.	858.93 ± 153.99	902.27 ± 234.25	0.435
Pocket money L.E.	17.53 ± 25.24	11.86 ± 20.01	0.393
Money expenses on medicine L.E.	0.00 ± 0.00	0.00 ± 0.00	-
Money expenses on food L.E.	483.93 ± 254.24	361.36 ± 132.67	0.033*
How long you had ARV therapy / years	4.07 ± 4.10	3.86 ± 3.86	0.856

* Significant p < 0.05

C- Laboratory investigation of the samples:

The results of table (4) show the mean and standard deviations for the sample with respects to laboratory investigation parameters of CD4 < 200cells/µL and CD4 > 200 cells/µL groups.

In respect to hemoglobin, hematocrit and RBC differences were very highly significant with mean values (9.375±0.619 g/dl, 28.12±1.85% and 3.12±0.21 10^6/ml) for CD4 < 200cells/µL group respectively, which were (12.76±2.10g/dl, 38.29±6.30 % and 4.25±0.69 10^6/ml) with p value (P< 0.000), whereas the reverse found for white blood cells which were in CD4 < 200cells/µL group high significantly (P< 0.001) lower than CD4 > 200 cells/µL

group, the mean values were (3.67±1.16 and 5.16±1.72 10^3/ml).

As well the mean values of platelet, creatnine and SGPT revealed no significant differences between both groups.

Table (4): Mean and standard deviations oftotal sample according to laboratory investigation of blood

Variable	CD4 < 200cells/µL Mean ± SD N 28	CD4 > 200 cells/µL Mean ± SD N 22	Normal value	T-test
HB g/dl	9.375± 0.619 L	12.76 ± 2.10 L	14-18	.000***
Haematocrit %	28.12 ± 1.85 L	38.29 ± 6.30	36-55%	.000***
WBC 10^3/ml	3.67 ±1.16 L	5.16 ± 1.72	4-11	.001**
RBC 10^6/ml	3.12 ± 0.21 L	4.25 ± 0.69 L	4.5-6.5	.000***
Platelet 10^3/ml	227.44 ± 86.45	235.56 ± 93.47	150-450	0.752
Creatinine mg/dl	1.01 ± 0.19	1.00 ± 0.20	0.5-1.3	0.921
SGPT u/l	32.28 ± 19.82	37.27 ±23.36	0-40	0.418

***Significant p < 0.001 **Significant p < 0.01

D-Food habits:

From table (5) it could be noticed that number of patients who skipped meal (none, breakfast, lunch or dinner) were (1, 13, 3 and 11) patients respectively for CD4 < 200cells/µL group, whereas omitted meal were of CD4 > 200 cells/µL groups (none, breakfast, lunch or dinner) were (4, 8, 4 and 6) patients respectively.

Percentage of patients drinking tea immediately after meal amounted to 82.1% and72.7% patientsamongCD4 < 200cells/µL and CD4 > 200 cells/µL groups respectively.

As regards pickles it could be observed that 20 patients from CD4 < 200cells/µL group and 13 patients from CD4 > 200 cells/µL group like to eat food with pickles.

In connection with cooking way (mesabek" stewed", boiled, grilled, and fried) were (14.3, 21.4, 7.1 and 57.1%) patients respectively from the CD4 < 200cells/µL group, whereas cooking way of CD4 > 200 cells/µL group were (mesabek, boiled, grilled, and fried) (9.1, 59.1, 22.7 and 9.1%) respectively.

Concerning to drink milk during meal, it was found that 67.9% of CD4 < 200cells/μL patients were drinking milk during meals and 63.6% of CD4 > 200 cells/μL patients were drinking milk during meals.

With reference to eating poultry with skin, it was found that (82.1 and 54.5%) of CD4 < 200cells/μL and CD4 > 200 cells/μL groups respectively were eating poultry with skin.

In case of eating fatty meat, percentage of patients were eating fatty meat 60.7% patients and 39.3% didn't do that among CD4 < 200cells/μL group, while patients were eating and don't eat fatty meat have the same percentage 50% of CD4 > 200 cells/μL group.

The majority of tested sample don't eat fruits and vegetables Moreover no one in both groups eat meat through last six months but for chicken almost of patients eat around 2 times.

Table (5): Frequency distributionof total sample according to food habits

Variable		CD4 < 200cells/μL (N 28)		CD4 > 200 cells/μL (N 22)		P. Value
		Frequency	Percentage	Frequency	Percentage	
Main meal	Breakfast	6	21.4%	6	27.3%	0.598
	Lunch	21	75%	14	63.6	
	Dinner	1	3.6%	2	9.1%	
Skipped meal	None	1	3.6%	4	18.2%	0.268
	Breakfast	13	46.4%	8	36.4%	
	Lunch	3	10.7%	4	18.2%	
	Dinner	11	39.3%	6	27.3%	
Added sugar	Much	11	39.3%	4	18.2%	0.176
	Moderate	5	19.9%	8	36.4%	
	Little	12	42.9%	10	45.5%	
Drink tea after meal	Yes	23	82.1%	16	72.7%	0.425
	No	5	17.9%	6	27.3%	
Preferred salts	Heavy	7	25%	2	9.1%	0.347
	Moderate	18	64.3%	17	77.3%	
	Light	3	10.7%	3	13.6%	
Prefer pickles	Yes	20	71.4%	13	59.1%	0.361
	No	8	28.6%	9	40.9%	
Favorite cooking way	Mesabek	4	14.3%	2	9.1%	0.002**
	Boiled	6	21.4%	13	59.1%	
	Grilled	2	7.1%	5	22.7%	
	Fried	16	57.1%	2	9.1%	
Preferred	Juice	2	7.1%	8	36.4%	0.000***

snacks	**Carbonate beverage**	8	28.6%	12	54.5%	
	Tea	18	64.3%	2	9.1%	
Drink milk during meals	**Yes**	19	67.9%	14	63.6%	0.773
	No	9	32.1%	8	36.4%	
Drinking water periodically	**Yes**	15	53.6%	12	54.5%	1.00
	No	13	46.4%	10	45.5%	
Eating chicken with skin	**Yes**	23	82.1%	12	54.5%	0.035**
	No	5	17.9%	10	45.5%	
Eating fatty meat	**Yes**	17	60.7%	11	50%	0.449
	No	11	39.3%	11	50%	
Eating almost of carbohydrates from	**Rice**	7	25%	12	54.5%	0.000***
	Macaroni	4	14.3%	9	40.9%	
	Bread	17	60.7%	1	4.5%	
Eating spicy foods	**Yes**	18	64.3%	17	77.3%	0.320
	No	10	35.7%	5	22.7%	
Eating fruits	**Yes**	5	17.9%	11	50%	0.016*
	No	23	82.1%	11	50%	
Eating vegetables	**Yes**	11	39.3%	10	45.5%	0.661
	No	17	60.7%	12	54.5%	
Eating sweets	**Yes**	20	71.4%	17	77.3%	0.640
	No	8	28.6%	5	22.7%	
Drink soda water	**Yes**	21	75%	14	63.6%	0.384
	No	7	25%	8	36.4%	
Eating fish	**Yes**	2	7.1%	2	9.1%	0.801
	No	26	92.9%	20	90.9%	
Eating the citrus	**Yes**	8	28.6%	8	36.4%	0.558
	No	20	71.4%	14	63.6%	
Suffering from Food allergy	**Yes**	17	60.7%	15	68.2%	0.585
	No	11	39.3%	7	31.8%	
Eating raw garlic	**Yes**	20	71.4%	13	59.1%	0.361
	No	8	28.6%	9	40.9%	
Eating meat in last six months	**Yes**	0	0 %	0	0 %	-
	No	28	100%	22	100%	
How often do you eat chickens in last six months	**One**	9	32.1%	4	18.2%	0.700
	Two	15	53.6%	15	68.2%	
	Three	1	3.6%	1	4.5%	
	Four	3	10.7%	2	9.1%	

* Significant $p < 0.05$ ** Significant $p < 0.01$ *** Significant $p < 0.001$

E- Health status of the study sample

Table (6) shows a wide variety of HIV/AIDS related symptoms experienced by the patients. There are significant relationships were found with some of known symptoms as constipation, diarrhea that lasts for more than a month, dryness of skin, weight loss, muscle wasting, recurring fever or Profuse night sweats, Sores of the anus or genitals, Red brown pink blotches of CD4 < 200cells/μL and CD4 > 200 cells/μL groups. In concern of other symptoms no known significant relationships were found.

Table (6): Frequency distribution of total sample according to the health status

Variable		CD4 < 200cells/Ml (N 28)		CD4 > 200 cells/μL (N 22)		P. Value
		Frequency	Percentage	Frequency	Percentage	
Nausea or vomiting	Yes	16	57.1%	10	45.5%	0.412
	No	12	42.9%	12	54.5%	
Mal-absorption	Yes	19	67.9%	12	54.5%	0.336
	No	9	32.1%	10	45.5%	
Loss of appetite	Yes	18	64.3%	10	45.5%	0.183
	No	10	35.7%	12	54.5%	
Constipation	Yes	8	28.6%	9	40.9%	.0361*
	No	20	71.4%	13	59.1%	
Diarrhea more than one month	Yes	13	46.4%	4	18.2%	0.036*
	No	15	53.6%	18	51.8%	
Heartburn	Yes	16	57.1%	13	59.1%	0.890
	No	12	42.9%	9	40.9%	
Lower limb edema	Yes	14	50.0%	6	27.3%	0.103
	No	14	50.0%	16	72.7%	
Dizziness	Yes	17	60.7%	12	54.5%	0.661
	No	11	39.3%	10	45.5%	
Fever	Yes	11	39.3%	6	27.3%	0.373
	No	17	60.7%	16	72.7%	
Fatigue	Yes	20	71.4%	16	72.7%	0.919
	No	8	28.6%	6	27.3%	
Headache	Yes	21	75.0%	17	77.3%	0.852
	No	7	25.0%	5	22.7%	
Dryness of skin	Yes	17	60.7%	6	27.3%	0.019*
	No	11	39.3%	16	72.7%	
Skin itching	Yes	12	42.9%	6	27.3%	0.254
	No	16	57.1%	16	72.7%	
Gum bleeding	Yes	8	28.6%	4	18.2%	0.393
	No	20	71.4%	18	81.8%	
Mouth Fungal infection	Yes	11	39.3%	6	27.3%	0.373
	No	17	60.7%	16	72.7%	
Mouth ulcer	Yes	12	42.9%	5	22.7%	0.136
	No	16	57.1%	17	77.3%	
Sore throat	Yes	12	42.9%	6	27.3%	0.254
	No	16	57.1%	16	72.7%	
Dysphagia	Yes	2	7.1%	1	4.5%	0.701

Variable		CD4 < 200cells/Ml (N 28)		CD4 > 200 cells/µL (N 22)		P. Value
		Frequency	Percentage	Frequency	Percentage	
	No	26	92.9%	21	95.5%	
Dental problem	Yes	18	64.3%	13	59.1%	0.707
	No	10	35.7%	9	40.9%	
Loss of taste	Yes	7	25.0%	4	18.2%	0.563
	No	21	75.0%	18	81.8%	
Weight loss	Yes	21	75%	9	40.9%	.015*
	No	7	25%	13	59.1%	
Muscle wasting	Yes	11	39.3%	14	63.6%	0.087*
	No	17	60.7%	8	36.4%	
Muscle and joint pains	Yes	22	78.6%	18	81.8%	0.776
	No	6	21.4%	4	18.2%	
Recurring fever / night sweats	Yes	22	78.6%	7	31.8%	0.001**
	No	6	21.4%	15	68.2%	
Extreme tiredness	Yes	16	57.1%	17	77.3%	0.136
	No	12	42.9%	5	22.7%	
Sores of the anus	Yes	12	42.9%	1	4.5%	0.002**
	No	16	57.1%	21	95.5%	
Pneumonia	Yes	1	3.6%	1	4.5%	0.861
	No	27	96.4%	21	95.5%	
Cough	Yes	14	50%	10	45.5%	0.749
	No	14	50%	12	54.5%	
Dyspnea	Yes	16	57.1%	7	31.8%	.067
	No	12	42.9%	15	68.2%	
Red brown pink blotches	Yes	13	46.4%	2	9.1%	0.004**
	No	15	53.6%	20	90.9%	
Memory loss	Yes	16	57.1%	12	54.5%	0.854
	No	12	42.9%	10	45.5%	
Depression and CNS disorders	Yes	20	71.4%	14	63.6%	0.558
	No	8	28.6%	8	36.4%	
Chronic disease	Yes	9	32.1%	5	22.7%	0.462
	No	19	67.9%	17	77.3%	
If yes what is a disease	TB	1	11.1%	1	20%	0.522
	HTN/DVT	7	77.8%	2	40%	
	Epilepsy	0	0%	1	20%	
	Asthma	1	11.1%	1	20%	
Smoking	Yes	7	25%	4	18.2%	0.563
	No	21	75%	18	81.8%	
Drinking	Yes	6	21.4%	4	18.2%	0.776
	No	22	78.6%	18	81.8%	
Swollen glands	Yes	2	7.1%	2	9.1%	0.801
	No	26	92.9%	20	90.9	
HIV/AIDS Pt. in your family	Yes	19	67.9%	9	40.9%	0.057*
	No	9	32.1%	13	59.1%	
Sick in the last month	Yes	16	57.1%	10	45.5%	0.412
	No	12	42.9%	12	54.5%	
Cause of infection	Blood transfusion	0	0%	5	22.7%	0.008**
	sex	28	100%	17	77.3%	

Significant $p < 0.05$ **Significant $p < 0.01$ ***Significant $p < 0.001$

F-Anthropometric measurements of the study samples:

The mean values of body mass index were (23.86±4.19 and 17.84±1.21) for CD4 > 200 cells/µL group and CD4 < 200cells/µL group respectively. This difference was very high significant (P< 0.001).

Percentage of body fat for both tested samples was less than normal range but still CD4 > 200 cells/µL group (93.17% of RDA) higher than CD4 < 200cells/µL group (59.36% of DRI).

Table (7): Mean and standard deviation of anthropometric measurements of tested sample

Variable	Less than 200 200cells/µL Mean ± SD (N 28)	% of RDA	More than 200 200cells/µLMean ± SD (N 22)	% of RDA	RDA	T-test
Weight (kg)	50.31 ± 2.73	79.86 %	67.29 ± 17.41	106.81 %	63	.000***
Height (m)	1.68 ± 0.06	102.4%	1.68 ± 0.109	102.4%	1.64	.782*
BMI (kg/m2)	17.84 ± 1.21	Under weight	23.96 ± 4.19	Normal range	18.5-24.99	.000***
Age	36.64 ± 10.85	-	38.36 ± 11.24	-	-	.587
Body Fat %	13.64%	59.36%	21.41%%	93.17%	22.98 %	.000**

* Significant p < 0.05 ** HighSignificant p < 0.01 ***Very HighSignificant p < 0.001

G - Nutrients intake of the study samples

1- Macronutrient

From data in table (8) it could be noticed that calories intake by CD4 more 200group (60.61% of DRI) were higher than CD4 < 200cells/µL group (45.24% of DRI) and Calories intake for both groups less than DRI%.

The percentage of total protein intake for CD4 more 200 group was75.35% of DRI higher than CD4 < 200cells/µL group which was 39.35% of DRI, this differences was statistically significant.

As for fat, that was highly significant differences between CD4 more 200 group and CD4 < 200cells/µL group (P< 0.001) CD4 more 200 group consumed more fat than CD4 < 200cells/µL group.

Table (8): Mean and standard deviation of macronutrient of tested sample

Nutrients		Less than 200 200cells/µL Mean ± SD	DRI%	More than 200 200cells/µL Mean ± SD	DRI%	DRI	t-test
Water		1593.61 ± 171.39	59.02%	1556.35 ±213.06	57.64%	2700	0.50
Energy (k.cal)*(1)		1236.88 ± 315.87	45.24%	1657.05 ± 549.73	60.61%	2734*	.003**
Protein (g/d)	**Animal protein (%)**	5.77 ± 15.48	——	26.07 ± 21.59	——		.001**
	Plant protein (%)	25.91 ± 6.25	——	34.58 ± 11.94	——		.004**
	Total protein(2)	31.68 ± 19.13	39.35%	60.66 ± 27.17	75.35%	80.5	.000***
Fat (g/d)	**Animal fat (%)**	4.53 ± 10.82	——	17.62 ± 13.58	——	——	.001*
	Plant fat (%)	22.64 ± 11.23	——	36.24 ± 21.31	——	——	.011**
	Total fat	27.16 ± 19	32.51%	53.85 ± 29.77	64.46%	83.54	.001**
Carbohydrate (g/d)		216.43 ± 54.59	52.15%	232.44 ± 77.01	56 %	415.04	0.394
Fiber (g/d)		8.29 ± 8.85	33.16%	18.68 ± 10.01	74.72%	25	0.00
Ash (g)		4.05 ± 2.19	——	8.11 ± 3.44	——	——	.000**
Cholesterol (mg/d)		30 ± 56.60	15%	133.78 ± 114.91	66.89%	≤ 200	.000**

* Significant $p < 0.05$ ** Significant $p < 0.01$ *** Significant $p < 0.001$

(1) Estimated Total calories + 10% for HIV/AIDS patients. **(Raiten *et al.*,2005).**

(2) DRI value (46) + ½ 50-100 (75%). **(Raitene*t al.*, 2005).**

2- Micronutrient:

With respect to the percentages of minerals intake it could be observed that daily intake of minerals for CD4 more 200 group higher than other group but mustlyboth group lower than the standard DRI.

Daily intake of potassium and Iron were lower than the standard intake, DRI for both tested samples, but were lower for CD4 < 200cells/µL group than CD4 more 200 group of the RDI.

Table (9): Mean and standard deviation of minerals intakesof tested sample

Minerals		Less than 200 cells/mm3 Mean ± SD	DRI%	More than 200 cells/mm3 Mean ± SD	DRI%	DRI	t-test
Calcium (mg)		201.11 ± 101.47	20.11%	366.03 ± 189.51	36.60%	1000	.001**
Phosphorus (mg)		473.31 ± 235.47	67.62%	938.36 ± 375.69	134.05%	700	.000***
Iron	Iron-A (mg)	0.81 ± 1.06	——	2.16 ± 2.01	——	——	.008*
	Iron-P (mg)	5.82 ± 1.84	——	10.16 ± 4.00	——	——	.000***
	Total Iron (mg)	6.675 ± 2.76	36.98%	12.32 ± 4.95	68.44%	18	.000***
Sodium (mg)		9117.77 ± 3749.8	607.85%	10667.36 ± 4697.38	711.15%	1500	0.201
Potassium (mg)		941.82 ± 439.01	20.04%	2012.01 ± 939.11	42.81%	4700	.000***
Zinc (mg)		4.35 ± 3.14	54.38%	9.04 ± 4.49	113.00%	8	.000***
Magnesium (mg)		183.43 ± 106.27	57.32%	334.98 ± 142.84	104.68%	320	.000***

* Significant p < 0.05 ** Significant p < 0.01 *** Significant p < 0.001

It is clear that the daily intake in all vitamins were significantly higher for CD4 > 200 cells/µL group than CD4 < 200cells/µL group, in both cases intakes of nearly aii minerals were less than DRI.

Table (10): Mean and standard deviation of vitamin intakes of tested sample

Nutrients	Less than 200 cells/mm3 Mean ± SD	DRI%	More than 200 cells/mm3 Mean ± SD	DRI%	DRI	t-test
Vitamin A (µg/d)	196.64 ± 373.61	28.09%	1338.10 ± 3818.75	191.16%	700	.177**
Vitamin C (mg)	11.71± 29.42	15.61%	30.38 ± 39.59	40.51%	75	.073*
Vitamin D (µg/d)	0.94 ± 3.30	6.27%	2.09 ± 4.58	13.93%	15	0.309
Vitamin E (mg)	27.08 ± 10.53	180.53%	37.07 ± 18.77	247.13%	15	.033***
Vitamin B1 (mg)	0.83 ± 0.30	75.45%	1.02 ± 0.38	92.73%	1.1	.055*
Vitamin B2 (mg)	1.00 ± 0.74	90.91%	2.22 ± 1.47	201.82%	1.1	0.001
Niacin (mg)	6.97 ± 3.90	49.79%	11.58 ± 6.62	82.71%	14	.007***
Vitamin B6 (mg)	0.56 ± 0.41	43.08%	1.14 ± 0.56	87.69%	1.3	.000*
Vitamin B12 (µg/d)	0.42 ± 0.95	17.5%	6.66 ± 19.76	277.5%	2.4	.154**
Folate (µg/d)	154.14 ± 72.82	38.54%	353.33 ± 179.83	88.33%	400	.000***

* Significant $p < 0.05$ ** Significant $p < 0.01$ *** Significant $p < 0.001$

3- Amino acids:

Data presented in table (11) show the amino acids composition of food consumed by CD4<200cells/µL and CD4 >200cells/µL groups respectively.

Table (11):Amino acid composition (g/100g food) of CD4< 200cells/µL and CD4 > 200cells/µL groups

Amino Acid	CD4 < 200cells/µL Mean ± SD	CD4 > 200 cells/µL Mean ± SD	t-test
Essential Amino Acids:			
Isoleucine	1.20 ± .83	2.26 ± 1.25	.001**
Leucine	2.06 ± 1.42	3.98 ± 2.12	.001**
Lysine	1.20 ± 1.46	3.04 ± 2.17	.002**
Methionine + Cysteine	1.00 ± .41	1.90 ±. 65	.002**
Phenylalanine + Tyrosine	2.49 ± .91	4.70 ± 1.33	.001**
Threonine	1.14 ± .76	2.14 ± 1.16	.001**
Tryptophan	.36 ± .22	.67 ± .33	.001**
Valine	1.57 ± .99	2.95 ± 1.48	.001**
Histadine	.65 ± .55	1.40 ± .80	.001**
Non- essential Amino acids:			
Arginine	1.51 ± 1.14	3.04 ± 1.68	.001**
Alanine	1.18 ± 1.03	2.55 ± 1.52	.001**
Aspartic	1.95 ± 1.70	4.17 ± 2.47	.001**
Glutamic	6.43 ± 4.03	11.84 ± 5.35	.000*
Glycine	1.10 ± .89	2.26 ± 1.29	.001**
Proline	2.29 ± 1.51	4.29 ± 1.92	0.00*
Serine	1.22 ± .83	2.36 ± 1.24	.001**

From result of table(11) it could be observed that all essential amino acids were much greater in CD4 >200cells/µL group when compared with that of the CD4 <200cells/µL group. This was parallel with the fact that food taken by CD4 <200cells/µL refuge patients with HIV/ AIDS receiving antiretroviral therapy, taking into consideration that the protein intake is extremely less than the desirable level (80.5 g/d).

The result of table (12) show the amino acids composition of food protein consumed by HIV/ AIDS patients

Table (12): Amino acids composition of food protein (g/100g protein) consumed by CD4< 200cells/µL and CD4 > 200cells/µL groups

Amino Acids	CD4 < 200cells/µL group	CD4 > 200 cells/µL group
Isoleucine	3.79	3.73
Leucine	6.5	6.56
Lysine	3.79	5.01
Methionine + Cysteine	3.16	3.07
Phenylalanine + Tyrosine	7.86	7.75
Threonine	3.57	3.53
Tryptophan	1.14	1.11
Valine	4.96	4.86
Histadine	2.05	2.31
Arginine	4.77	5.01
Alanine	3.73	4.20
Aspartic	3.16	6.87
Glutamic	2.03	19.50
Glycine	3.47	3.73
Proline	7.23	7.07
Serine	3.85	3.89

Data of table (12) indicated that protein of CD4 >200cells/µL had more contacts than CD4<200cells/µL only in 4 EAA, while the reverse noticed for the other six EAA, although the protein intake was much more for the former than the latter protein (table 8).This may assume that protein quality was better in the second than the first case. EAA contacts as % of DRI are shown in table (13).

Table (13): EAA content % of DRI as calculated for CD4< 200cells/µL and CD4 > 200cells/µL groups

Amino Acid	CD4 < 200cells/µL group	CD4 > 200 cells/µL group	DRI
Isoleucine	152	149	2.5
Leucine	118	119	5.5
Lysine	74	98	5.1
Methionine + Cysteine	126	125	2.5
Phenylalanine + Tyrosine	167	165	4.7
Threonine	132	130	2.7
Tryptophan	163	159	0.7
Valine	155	152	3.2
Histadine	114	128	1.8

When EAA calculated as % of DRI (table 13), it was concluded that the higher level of EAA may not be the corn stone in food quality since appreciable increase of EAA (than DRI) may not be needed. Anyhow from result of table (13), data revealed that although CD4<200cells/µL group food was less than CD4>200cells/µL group in all of the EAAs, the second group food is better. The limiting EAA (LA) in the both cases (lower % AA) was lysine in the both cases, and the LA value was actually more for CD4>200cells/µL group. This was confirmed by the results of table (11) where due to taking more protein (table 8) for CD4>200cells/µL than CD4<200cells/µL all EAA were higher in the former than letter case. Finally it could be assumed that the quality of protein and its intake was better for CD4>200cells/µL than CD4<200cells/µL group, possibly due to more income which enabled patients to choose more high quality food in the 2nd than 1st case regardless of less money expenses on food (table 13).

To confirm the idea that protein quality of CD4>200cells/µL than CD4<200cells/µL groups, based on higher LA level in the first than the second case (being 98&74% respectively) (table 13) PER was calculated by three formula according to **Alsmeyer (1974),** and quality of protein in the relation to whole egg protein **(Oser, 1959)**were calculated and resulting are presented in table (14).

Table (14): Protein efficiency ratio (PER), essential amino acids index (EAAI) and biological value (B.V)as calculated for CD4 < 200cells/µL& CD4 > 200cells/µL groups

PER	CD4 < 200cells/µL	CD4 > 200 cells/µL
PER1	1.94	1.98
PER2	2.15	2.17
PER3	1.48	1.56
PER	21.60	70.61
PER1	11.81	65.24

Data of Table (14) indicated that undoubtedly the quality of protein consumed by CD4>200cells/µL was much better than that of CD4<200cells/µL group. Thereby the level of taken protein (table 8) being 60.66 &31.68 g/100g food per day should actually rise to 80.5g.

Discussion:

The majority of tested sample subjects were from Sudan and they had dark skin color. Africans with dark skin color need to spend longer time in the sun than patient with fair skin to get the same amount of vitamin D. this was according to results published by**Winzenberg and Jones (2013).**

According to CD4 Wikipedia (2018) CD4 cells are the most important immunity cells of the immunity apparatus in the body. This number in healthy human is 200-500 cells/µL. Over 350 cells/µL, it is not recommended to have a therapy for virus, less than 350 cells/µL, and therapy for the virus is advised. Less than 200 cells/µL,the patient is a risk of infection and disease.

Single female were (64.3% and 36.4%) of the CD4 < 200cells/µL and CD4 > 200 cells/µL groups respectively. Patients which infected with HIV through sexual relationship represented all CD4 < 200cells/µL group and 77.3% of CD4 < 200 cells/µL group May patients of sample exposed to violence and raping in traffic from their countries to another one or due to sexual abuse and poverty. These result found by **(Jewkesand Garcia, 2002)**.

In the present study, no statistically significant association was observed between educational statuses with dietary diversity for both groups although **Zaramba(1998)** showed a difference in dietary diversity between people of limited or little education in comparison to the people who were more educated. This finding contrasts to findings

from other studies which established that higher education is associated with the regular consumption of a wider variety of foods **(Clausen *et al.*, 2005)**.

Lacks of job opportunities are similar between two groups in Egypt. More than 75% of women in both groups were jobless, even job of working women were inconsistent jobs, while their current job did not always provide a good income.**Chen (2001)** reported the same result. Accordingly patients will to be less able to spend money on food due to low income. This indicates the higher risk of developing malnutrition in unemployed subjects **(Hailemariam *et al.*,2013)**.

Poverty may lead to high-risk sexual behaviors and migration, increasing the risk of acquiring HIV infection **(Loevinsohn& Gillespie, 2003)**.

It is noticed that there is significance differences in money expenses on food between two groups, CD4 < 200cells/µL group spend money on food more than CD4 > 200 cells/µL group contrary to expectations that contradiction may be due to financial assistance and donation given by some organizations and helping people, but they get donations after deteriorate their case and lowering CD4. The same result found by **(Diamond and Iyer, 2007)**.

Through our study it was found that more than three quarter of both groups hasn't care giver, may be due to stigma of HIV/AIDS patients (**HelpAge International, 2004)**.

It could be noticed that almost of CD4 < 200cells/µL group were lived in unhealthy home which represented 78.6% of this group compared with other group which were 45.5% of group which has negative effect in their health .

Group of CD4 < 200cells/µL had the lowest Hb%, hematocrit, WBC and RBC were (9.38 g/dl,28.12%,3.6710^3/ml and 3.12 10^6/ml) respectively but for CD4> 200 cells/µL records value nearest from normal with highly significant differences.**Antelman *et al.*,(2000)** reported same results. There is association between lowCD4 cell count and the presence or development of anemia **(McCullagh and Nelder, 1989).**Moreover CD4 < 200cells/µL group has bad food habits with significant differences between two groups as drink of tea during and after meal.

Drinking tannin-containingbeverages such as tea with meals may contribute to the pathogenesis of iron deficiency **(Disler *et al.*, 1975)**.Drinking milk during meal may affect on iron absorption; this result is similar to what was found by**Leif *et al.*,(1991)**. Fried food and eating chicken with skin considered of unhealthy habits which had negative effect on health. It is noticed that there are more than half of CD4 < 200cells/µL practices these habits

The samelow CD4 cell group (82.1%) not eating fruit with also mostly low consumption of vegetables. Fruit and vegetable provide important nutrients needed for a nutritious and healthy diet which is important for HIV/AIDS patients. These food groups are good source of vitamin and minerals. They are vital for normal body functions such as immune system function in HIV-infected patients **(FANTA, 2004).**

All tested sample suffering from health problems as GIT, skin, chest and CNS problems. It is noticed that CD4 < 200cells/µL suffering from Constipation, Diarrhea, Weight loss, Dryness of skin, Recurring fever, Night sweats, Sores of the anus, Red brown pink blotches more than CD4 > 200 cells/µL with significance differences. These side effects included; nausea, numbness, headaches, reduced appetite and vomiting were found to affect the food intake of the patients, hence predisposing them to malnutrition. Plus this may have been partly responsible for the unintended weight loss that was reported by CD4 < 200cells/µL group which appear in BMI result was underweight and body fat % was 59.36% compared with other group which was in normal range**(Sachdeva *et al.*, 2011)**.

It could be noticed that calories intake were less than DRI for both groups which were 59.02 and 57.64% of DRI for CD4 < 200cells/µL and CD4 > 200 cells/µL groups respectively,through HIV patient, who has no symptoms, requires 10% more energy above the level recommended for a healthy non-infected person **(Raiten *et al.*, 2005).**

If energy intake is insufficient, protein will be used to provide the body with energy this means that there will be less protein available for maintaining muscle tissue and strengthening the immune system **(ShevitzandKnox, 2001)**.

The percentages of protein intake of CD4 > 200cells/µL group was 75.35% more than CD4 < 200cells/µL which was 31.68% when compared with DRI.

Food intake of protein of HIV/AIDS patients in tested sample especially CD4 < 200cells/µL group is very low comparing with DRI and major source of protein for CD4 < 200cells/µL group was plant proteins compared to the low intake from animal proteins, animal sources tend to be richer sources of micronutrients and the nutrients are high in absorbable or bioavailability of nutrients; for example iron, zinc, and vitamin A **(Piwozand Preble, 2002)**.

As compared with **DRI (2002)** for ideal protein the consumed protein by groups was low in lysine (limiting EAA) although quality of protein for CD4 > 200cells/µL group seems to be better than that of CD4 < 200cells/µL group of indicated by calculating PER by 3 formula, EAAI and B.V. compared to whole egg protein.

Among the foods patients felt should consume more meat and chicken for both groups the study found that the tested sample of both groups not eating meet even once through last six months and eating chicken around two times through last six months . Meat and chicken are a good source of protein, which is essential for building muscles, organs, and a strong immune system. This might beindication of a lack of money as mentioned before and knowledge of the nutritional value of meat especially for HIV/AIDS patients **(Sachdeva *et al.*, 2011)**.

Daily intakes of all minerals for both groups were less than DRI. But CD4 < 200cells/µL group has worst situation than other group with highly significant differences. Lowest iron intake mean hemoglobin values, reflective of iron deficiency anemia, which reflect lower diet variation, an indicator of poor diet quality **(Antelman *et al.*, 2000)**.

For vitamins all percentage of DRI of CD4 more 200 group higher than CD4 < 200cells/µL group and the results show all percentage value of DRI for CD4 < 200cells/µL group less than DRI% except vitamin E which was 180.53% of DRI but actually not all Vitamins intake was absorbed HIV/AIDS patient suffering from mal absorption and mal-digestion.

The consumption of vegetables and fruits was very low in patient‘s diet yet these are the major sources of zinc, iron and vitamin A, the essential micronutrients in the diet of patients living with HIV/AIDS. Deficiencies of vitamin A deficiency and iron contribute to oxidative stress, a condition that may accelerate immune cell death and increase the rate of HIV replication **(WHO, 2005)**.

Vitamin B complex, E and C and antioxidants delay the progression of the HIV/AIDS disease, incidence of complications such as oral thrush, oral ulcers and difficulty in swallowing, which are potential indicators of esophageal candidiasis **(WHO, 2003)**. They also reduce the prevalence of side effects of the ARV drugs, for example nausea, vomiting and diarrhea **(Kim *et al.*, 2001)**.

Through our study it found that this patients need for micronutrient supplementation. Daily micronutrient supplementation improve body weight and body cell mass **(Shabert *et al.*, 1999)**; reduce HIV RNA levels improve CD4 cell counts **(Miller, 2003 and Jaimton, 2003)**; and reduce the incidence of opportunistic infections **(Melvin *et al.*, 1997).**

Recommendations

The result and discussion of patient work calls for more care about the nutritional and health status of HIV/AIDS refugee patients especially in concern to UN AIDS offered to foreign courtier giving shelter to them. UN may also take part in patients diets, medical treatment and educational programs, if foreign courtiers have limited possibilities for aid.

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الحاله الغذائيه واعداد خلايا لمرضي نقص المناعه البشري المكتسب / الايدز اللاجئيين الذين يتلقون علاجا مضادا للفيروس في مصر

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الملخص العربي

يمكن للتقييم التغذوي أن يكشف عن أي نتائج غير طبيعية في وقت مبكر ,ومن هنا تم التقييم الغذائي الذي أجري ل 50 مريضه من فيروس نقص المناعة البشرية / الإيدز من جنسيات مختلفة (السودان وإريتريا وإثيوبيا وسوريا والعراق والصومالي وزمبابوي) فيمصر(عياده مصر الملجأ بالزمالك) وتم تقسيمهم إلى مجموعتين، مجموعة CD4 اقل من 200 خلية / ميكرولتر ومجموعة CD4 اكبر من 200 خلية / ميكرولتر لدراسة العوامل التي قد تؤثر على الحالة التغذوية والكشف عن المشاكل التغذوية التي تتعلق بمرضى فيروس نقص المناعة البشرية / الإيدز للاجئين. تم اخذ القياسات الأنثروبومترية (الوزن و الطول ومؤشر كتلة الجسم)، المأخوذ من الطعام والفحوصات المعمليه. وأظهرت النتائج أن المتناول اليومي من المغذيات الصغري والكبري لكل من المجموعتين كانت منخفضة ولكن في حاله CD4 اقل من 200خلية / ميكرولتر كان أقل من مجموعةCD4 اكبر من 200 خلية / ميكرولتر وفقا ل DRI. مجموعة CD4 اقل من 200 خلية / ميكرولتر تعاني من النحافه ولكن مجموعة CD4 اكبر من 200 خلية / ميكرولتر كان مؤشر كتله الجسم في المعدل الطبيعي. وكان معظم المرضى من السودان. وكان معظم عينة الدراسه ذوى بشره سمراء .

وكانت غالبية عينه الدراسه من الإناث الغير متزوجات (64.3٪ و 36.4٪) CD4 اقل من 200 خلية / ميكرولتر و CD4 اكبر من 200 خلية / ميكرولتر على التوالي. المرضى الذين أصيبوا بفيروس نقص المناعة البشرية من خلال العلاقة الجنسية يمثلون كل مجموعة CD4 اقل من 200 خلية / ميكرولتر و 77.3٪ من المجموعه الاخري.و قد يتعرض مرضى العينة للعنف والاغتصاب خلال نزوحهم من بلادهم إلى بلد اخري أو بسبب سوء ممارسه الجنس و الفقر. وكان الافتقار إلى فرص العمل أكثر من 75 في المائة من النساء في كلا المجموعتين الذين كانوا عاطلين عن العمل، بل إن وظيفة النساء العاملات كانت وظائف غير ثابته في حين أن وظيفتهن الحالية لا توفر دائما دخلا جيدا.في مجموعة CD4 اقل من 200 خلية / ميكرولتر كانت تعيش في منزل غير صحي، حيث مثلت 78.6٪ من هذه المجموعة مقارنة مع المجموعة الأخرى كانت 45.5٪ التي لها تأثير سلبي على صحتهم. معظم عينه الدراسه تعاني من مشاكل في الجهاز الهضمي ولكن وجدت أكثر . مجموعة CD4 اقل من 200 خلية / ميكرولتر ، والآثار الجانبية من الادويه التي تعالج الفيرس (الغثيان، والتقيؤ، أو الإسهال أي) يمكن أن يكون لها تأثير كبير على المتناول من الغذاء فقر الدم هو أكثر شيوعا في مجموعة CD4 أقل من 200 خلية / ميكرولتر من خلال الاختبارات المعمليه ، وفقاً لانخفاض في مستويات الهيموغلوبين والهيماتوكريت بينما كانت معظم نتائج الاختبارات المعمليه لدي مجموعه مجموعةCD4 اكبر من 200 خلية / ميكرولتر ضمن القيم الطبيعيه.

وكان السعرات الحرارية أقل من DRI لكلا المجموعتين التي كانت 45.24 و 60.61٪ ل CD4 اقل من 200 خلية / ميكرولتر و CD4 اكبر من 200 خلية / ميكرولتر على التوالي على الرغم من أن مريض فيروس نقص المناعة البشرية الذي لا يوجد لديه أعراض يتطلب 10٪ أكثر من الطاقة فوق المستوى الموصى به لشخص غير مصاب. وكانت المآخوذ اليومي لجميع المعادن لكلا المجموعتين أقل منDRI. ولكن مجموعة CD4 اقل من 200 خلية / ميكرولتر أسوأ حالاً من المجموعة الأخرى. وكانت نسبة البروتينات لمجموعة CD4 اكبر من 200 خلية / ميكرولتر أكثر من المجموعه الاخري حيث كان المأخوذ 31.68٪ بالمقارنة معDRI والمصدر الرئيسي للبروتين لمجموعة CD4 اقل من 200 خلية / ميكرولتر كان البروتينات النباتية. كان استهلاك الخضروات والفواكه منخفضاً جدا في النظام الغذائي للمرضي لكلتا المجموعتين.