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Study on the nutritional status of HIV infected adults

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ABSTRACT

The present study was undertaken to assess the nutritional status of HIV subjects in Dindigul District, Tamilnadu, India. Samples for the study comprised 100 subjects in the age group of 20 to 55 years. The nutritional status of the selected subjects was assessed by anthropometric measurements, biochemical, clinical examination and diet survey. The results revealed that fifty three percent of the subjects had low level of CD $_4$ cell count and all the subjects had below the normal levels of hemoglobin and their dietary intake was very low in micronutrients.

Introduction

The world's biggest challenges today emerges from four simple letters AIDS which stands for Acquired Immuno Deficiency Syndrome. The rate at which humanity falls prey to this plaque needs serious introspection. In India one percent of the total population is infected with HIV are through unethical sex and drug addiction being are the two common causes of AIDS. Nutrition plays a critical role in comprehensive care and support for people living with HIV. Nutritional interventions can help manage symptoms, promote response to medical treatment, slow progression of the disease and increase the quality of living. Dindigul district alone had over 8000 persons living with HIV but only 3411 subjects had registered with Anti- retroviral therapy centre of which 1,687 subjects got regular treatment (The Hindu, 2010). Hence this investigation was undertaken with an objective to assess the nutritional status of the HIV/infected subjects registered at ICTC centre in Dindigul District.

Materials and methods:

Selection of subjects:

A total of hundred HIV infected persons, in the age group of 20 to 55 years who were willing to participate in this study were selected using purposive sampling method from government hospital, Dindigul district; Tamil Nadu, India. All the selected hundred samples were assessed for their nutritional status. Among the selected subjects 56 were males and 44 were females.

Socioeconomic status:

The information regarding age, gender, educational qualifications, size of the family, type of the family, income and occupation of the selected HIV subjects were collected using a well structured interview schedule.

Nutritional status

a)Anthropometric measurement: Based on the height and weight of the subjects the Body Mass Index (BMI) was calculated and the values were then compared with World Health Organization standards for under weight, normal and overweight.

b) BMI=weight (kg)/height m^2. Height and weight are physical dimensions of the body that reflect the nutritional status. The height and weight of all the samples were recorded.

c) Clinical assessment: Clinical assessments were carried out with HIV subjects, using the formulated interview schedule. A thorough history and physical examinations with attention to symptoms manifested on the skin, nail, hair, stomach, respiratory symptoms and eyes and other symptoms were observed and recorded.

d) Biochemical assessment: Biochemical estimation was done by trained medical laboratory technician according to the protocol to be followed for testing HIV patient's blood. The immunity levels of the subjects were tested using the CD $_4$ count and blood hemoglobin.

d)*Dietary factors:* Data regarding the nature, quality and quantity of food consumed were collected using a 24 hour recall method. The raw equivalents was calculated and the nutrients namely energy, carbohydrate, protein, fat, iron, beta carotene, vitamin C and folic acid was computed by using the food consumption table from Nutritive Value of Indian Foods given by ICMR (Gopalan, 2007).

Results and discussion

Socio economic status:

Table 1 indicates that most of the subjects 57 percent were in their the age group of 30 to 39 years followed by 27, 8 and 8 percent of subjects in 40 to 49, 50 to 55 and 20 to 29 years respectively. Majority of 56 percent of subjects were male and only 44 percent of them were females. Young women, especially in their 15 to 24 age groups, are vulnerable to HIV infection than their age-matched male (16.9% vs.3.7%) **(**Dorrington *et al.* 2006 and Pettifor *et al.* 2005).

Forty percent of the subjects had completed high school education and 17 subjects had only primary school education, five percent of the subjects had higher secondary education and only one subject was a graduate and 37 subjects were illiterates. The monthly income of majority of the subjects was Rs 1000 to 4000 per month and for 23 subjects it ranged from Rs 4000 to

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7000 and for 4 subjects it was above 10,000 per month. Major occupation of the subjects was found to be coolies. In resource poor countries, many people live below poverty line and there is often no medical insurance or disability pension for people living with HIV (Katabira, 2002). Ninety four percent of the subjects were in nuclear family and 68 percent of the subjects had small family size.

Table 1. Socio economic status of the selected subjects

Particulars	Subjects N=100	Particulars	Subjects N=100
Age		**Type of the family**	
20-29	8	Nuclear	94
30-39	57	joint	6
40-49	27		
50-55	8		
Gender		**Income of the family**	
Male	56	1000-4000	
Female	44	4000-5000	73
		7000-1000 and above	23
Educational qualification	37		4
Illiterate	17		
1-5 Standard	40		
6-10 Standard	5		
11-12 Standard	1		
Under graduate			
Size of the family		**Occupation**	
Small (1-3)	68	Agriculture	20
Medium(4-5)	32	Cooli	62
Large (5 and above)	-	Business	18

Nutritional status of the selected HIV subjects:

Body Mass Index:

It was found that 29 percent of male and 12 percent of female selected subjects were underweight, 24 percent of male and 28 percent of female subjects had normal Body Mass Index of 18.6 to 24.9 and six percent (3 male and 3female) of the subjects had a Body Mass Index of 25.0 to 29.9 and was in grade I obesity and one percent of female subject had grade II obesity. Obi *et al*. (2010) conducted a study on nutritional status of HIV-positive individuals on free HAART treatment in a developing nation and found that there malnourished individuals among the HIV-positive group than in the control group ($P < 0.05$) it concluded that malnutrition is common among HIV-positive subjects in southeast Nigeria. Table 2 shows the BMI of the selected HIV infected subjects.

Table 2. Body mass index of the selected HIV infected subjects

BMI	Range	Subjects n=100	
		Male n=56	Female n=44
Under weight	Less than 18.5	29	12
Normal	18.6 to 24.9	24	28
Obese I	25.0 to 29.9	03	03
Obese II	30.0 to above	Nil	01

Clinical assessment:

Clinical assessment is an important practical method for assessing the nutritional status of the community. The clinical assessment reveals that 53percent (31 male and 22 female) subjects had distaste for food, 56 percent (34 male and 22 female) subjects had wasting of muscle, 41 percent (28 male and 13female) had some skin infections,31 percent (19 male and 12 female) of the subjects had tooth caries, 48 percent (31 male and 17 female) had early satiety, 52 percent (37 male and 15 female) had thin-sparse hair, 45 percent (36 male and 19 female) had pale conjunctiva, 49 percent (31 male and 18 females) had spoon shaped nails, 35 percent (25 male and 10 female) had discoloration of eyes, 38 percent (22 male and 16 female) had bleeding gums, 32 percent (20 male and 12 female) had skin ulcers and 22 percent (13 male and 09 female) of the subjects had nausea .

a)Biochemical assessment:

The Table 3 result shows that all the subjects had haemoglobin levels below the normal level of haemoglobin (12.9 g/dl). Haemoglobin level is the most commonly used indicator to detect anaemia at the field level. Lower levels of haemoglobin, albumin, and serum cholesterol have been identified as predictors of faster disease progression and decreased survival (Posner, 1998).

The CD_4 count of the selected HIV infected adults were recorded and found that 12 percent (4 male and 8 female) of the subjects had >250 mm^3, 20 percent (11 male and 9 female) of the subjects had 250 to 500 $mm^{3,}$ twenty one percent(13 male and 8 female) of subjects had 500 to 1000 mm^3, 16 percent (9 male and 7 female) of subjects had 1000 to 1500 mm^3, and 31 percent (19 male and 12 female) subjects had above the level of 1500. $CD4^+$ T cell numbers decline below a critical level of 200 cells per µL is indicated of HIV infection or AIDS (Wood, 2003).

Table 3. Biochemical parameters of selected HIV infected subjects

Biochemical parameters	Subjects n= 100		Reference value *	
Haemoglobin Level	**Male**	**Female**	**Male**	**Female**
Below 6.9	02	01	13.5-17.91 g/dl	12.0 – 15.5 g/dl)
7 - 9.9	42	38		
10 -12.9	12	05		
CD_4 Cell count	**Male**	**Female**	**Male**	**Female**
Below 250	04	08	(400-1600 mm^3)	(400-1600 mm^3)
251 -500	11	09		
501 – 1000	13	08		
1001 – 1500	09	07		
1501 and above	19	12		

*ICMR (2001)

a) Mean nutrient intake of the selected subjects:

The mean nutrient intake for the selected male subjects were found to be as follows, calories 3210 kcal, protein 42g, fat 29g, calcium 303 mg, iron 16 mg, beta carotene 819 µg, vitamin C 28 mg folic acid 32 mg, and 3 mg zinc. The mean nutrient intake has been compared with RDA, which reflects the percent adequacy of energy (11) and fat (44) . All the other nutrients were deficit in selected 100 subjects, other nutrients namely protein, calcium, iron, beta carotene, vitamin C, folic Acid and zinc by - 30, - 24 - 41, - 66, - 30, and - 68,and -67 percent respectively.

The mean nutrient intake for the selected female subjects were found to be as follows, calories 2874 kcal, protein 33.6g, fat 26.9g, calcium 382.4mg, iron 18.1 mg, beta carotene 873.6 µg, vitamin C 30.4mg , folic acid 30.9 mg and 3.6 mg zinc. The mean nutrient intake has been compared with RDA, which reflects the percent adequacy of energy 29.1 and fat 34.5 respectively. All the other nutrients were deficit in selected 100 subjects, other nutrients namely protein, calcium, iron, beta carotene, vitamin C, folic Acid, and zinc by - 32, - 4.5, - 9.6, - 63.6, - 24, and - 69.1, and – 44 respectively. The results clearly point out that all the subjects had a deficient intake of protein, calcium, iron, beta carotene, vitamin C, folic acid, and Zinc.

Dietary management of HIV and AIDS related symptoms can prevent malnutrition and improve the overall health and nutritional status of People Living with HIV (PLHIV). HIV-infected individuals have higher rates of malnutrition, anaemia, and hypo albuminemia than socioeconomically matched HIV-uninfected individuals and despite similar caloric intake (Swaminathan *et al*. 2008).

Conclusion:

All the subjects had low level of hemoglobin and low level of nutrient intake except for energy and fat. There is need to give diet counseling to the subjects regarding nutritional status of the HIV infected subjects to reduce the opportunistic infections and improve their health status.

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