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Research Article

A COMPARATIVE INTERVENTIONAL STUDY BETWEEN INDIVIDUAL VERSUS GROUP NUTRITIONAL COUNSELLING TO IMPROVE NUTRITIONAL STATUS (WEIGHT AND BMI) AMONGST HIV POSITIVE PATIENTS

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ABSTRACT
Background: Human immunodeficiency virus (HIV), immune expression and nutrition interactions are complex and related to each other. Malnutrition is a frequent complication of HIV infection and is associated with a poor prognosis. HIV can cause or worsen malnutrition due to decreased food intake, increased energy requirements and poor nutrient absorption.
Material and Methods: A comparative interventional study was carried out in the ART centre of T. N. Medical College and Nair Hospital, Mumbai during the period of July 2011 to February 2012. A total of 203 (123 individual and 80 group counselling) patients were scheduled for nutritional counseling session with care giver. The session includes pre-designed, semi-structured interview for individual counseling patients. Group counseling was done with the help of workshop by trained personnel like doctors and dietician. Workshop on nutritional counseling includes lectures, group discussion and exhibition of ICE material. Results were analyzed by using Statistical Package of Social Sciences (SPSS) 16.0.
Results: In the present study, 58 (47.15%) males and 65 (52.85%) females were counseled in individual counselling, while 51 (63.75%) males and 29 (36.25%) females were counseled in group counselling. Average increase in mean weight in individually counseled patients were 2.376 kg and in group counselling it was 1.396 kg. The average increase in mean BMI in individually counseled patients was 1.057 and in group counselling it was 0.570.
Conclusion: The effects of nutritional counselling in our study groups were favourable. There was an improvement in nutritional status (weight and BMI). The individual counseling was more effective than group counseling in increasing weight and BMI of patients particularly in underweight patients.

Key Words: *Nutritional Counselling, People Living with HIV/AIDS (PLWHA), Antiretroviral Therapy (ART), Body Mass Index (BMI)*

INTRODUCTION
Malnutrition is a frequent complication of human immunodeficiency virus (HIV) infection and is associated with a poor prognosis (Henzel *et al.*, 1999). Malnutrition is defined as "the cellular imbalance between supply of nutrients and energy and the body's demand for them to ensure growth, maintenance and specific functions" (Scrimshaw *et al.*, 1968). However, many ART centers lack dedicated nutritional counselor or dietician. Consumption of proper nutrients, which can be enhanced by knowledge of importance of good nutrition for the PLWHA and proper dietary practices, can support an already-compromised immune system (Walsh *et al.*, 2003). Though there are many Indian studies on HIV prevalence, opportunistic infections and about patients high risk behavior, but very little is known about nutritional counseling, awareness and dietary practices followed by PLWHA. The macronutrient supplementation did not result in significantly increased weight gain compared with standard care (including nutritional counseling) among patients with moderately advanced HIV disease (Swaminathan *et al.*, 2010). There was no firm conclusions can be drawn about the effects of macronutrient supplementation on morbidity and mortality in people living with HIV (Mahungulu S et al., 2007). In resource limited setting individual nutritional counseling as well as macronutrient supplementation is not always feasible, but the group counseling may be a practical alternative. Therefore, this study was undertaken to compare impact of various nutritional counseling strategies

like group counseling versus individual nutritional counseling in people living with HIV/AIDS with socio-demographic characteristics at a tertiary care teaching hospital in Mumbai.

MATERIALS AND METHODS

This pre and post-test interventional study was carried out during the period of July 2011 to February 2012 at ART Centre of Topiwala National Medical College & BYL Nair Hospital, Mumbai. Ethical committee of the T. N. Medical College, Mumbai had approved the study. HIV positive patients on first line ART treatment as per NACO guidelines and age >18 years of either sex as an inclusion criteria were enrolled for the study. In the study group A i.e. for individual counselling the total 123 patients were enrolled and in group B i.e. for group counselling the total 80 patients were enrolled. No one refused to participate in the study. Hence the total sample size from both groups came to 203 patients. All the patients included in the study were informed about the purpose of the study. Informed consent of each participant was taken.

The study group-A, patients were scheduled for individual nutritional counseling session with care giver which included pre-designed, semi structured interview. Health counselors from HIV service organizations were the main source of health and nutrition information. The information included general care for the PLWHA, importance of good nutrition for the PLWHA and proper hygiene practices. Patients were counseled individually for dietary practices and also for symptoms based nutritional counseling. This was carried out by ART team with the help of handouts.

In group-B, the total 80 patients were enrolled for group counseling. Group counseling done with the help of workshop by trained personnel like doctors and dietician. Workshop on nutritional counseling includes lectures, group discussion and exhibition of IEC material. All participants were counseled for good dietary practice and hygiene. A pre-designed and pre-tested questionnaire was used to get information regarding socio-demographic factors and dietary practices of patients. All the questions were asked in the participant's language or else the meaning was conveyed properly. Patient's height, weight and BMI were recorded by counseling team at Visit I. All patients in individual nutritional counseling group were given diet sheet after assessing daily nutritional requirements. The underweight patients were counseled for the importance of adding snacks in-between meals, to increase size of portion during meals and add feed (oil, sugar etc.) to increase the energy content of dish. Patients were advised to follow-up at one month interval for visit II & III. The relevant data including weight and BMI was measured and entered in patient's case report form. At the end of visit III, patients were assessed for their dietary practices. Socio-economic status was assessed by the modified BG Prasad classification. Data were entered in MS Excel and analyzed using Statistical Package of Social Sciences (SPSS) 16.0. Statistical significance was set at $P \leq 0.05$.

RESULTS

Out of the total 203 study participants, 53.7% were males and 46.3% were females. The socio-demographic profile of the study participants is shown in **Table 1**. The mean age of the participants was 36±5 years. As expected, most of the patients (34.8%) belonged to lower middle class socio-economic status, whereas almost half of the patients (41.3%) were only educated to the primary level.

Association of mean weight and body mass index in visit I & III in the study population in group A was depicted in **Table 2.** The change in mean BMI was observed to be from baseline Visit I (20.859) to Visit III (21.916).

Association of mean weight and body mass index for group B patients in visit I & III was depicted in **Table 3.** The change in mean BMI was observed to be (21.904) at visit I to (22.474) Visit III and mean weight change from baseline at Visit I (53.82) to Visit III (55.213)

As seen from **Table 4** that average increase in mean weight in group A patients were 2.376 kg and group B it was 1.396 kg. Whereas average increases in mean BMI in group A patients was 1.057 and group B it was 0.570.

As observed from **Table 5** that at the visit I, in individual counseling group, 28 (23%) patients were underweight, while at the visit III number decrease to 5 (4%) which is statistically significant.

Table 1: Socio-demographic characteristics of the study population

Socio-demographic characteristics	Group-A Individual counselling (n=123)	Group-B Group counselling (n=80)
1. Age (in years)		
18-25	04 (3.25)	03 (3.75)
26-35	48 (39.02)	35 (43.75)
36-45	57 (46.34)	31 (38.75)
46-55	12 (9.76)	08 (10.00)
>56	02 (1.62)	03 (3.75)
2. Gender		
Male	58 (47.15)	51 (63.75)
Female	65 (52.84)	29 (36.25)
3. Socio-economic status		
Upper (I)	02 (1.62)	01 (1.25)
Upper Middle (II)	09 (7.31)	50 (62.50)
Lower Middle (III)	91 (73.98)	17 (21.25)
Upper Lower (IV)	20 (16.26)	11 (13.75)
Lower (V)	01 (0.81)	01 (1.25)
4. Educational status		
Illiterate	31 (25.20)	18 (22.50)
Primary (1-4)	47 (38.21)	46 (57.50)
Secondary (5-10)	41 (33.33)	10 (12.50)
Higher secondary	04 (3.25)	06 (7.50)
5. Occupation		
Housewives	60 (48.78)	35 (43.75)
Labourer	55 (44.71)	41 (51.25)
Service	05 (4.06)	02 (2.50)
Self employed	03 (2.43)	02 (2.50)

Figures in parenthesis indicates percentage

Table 2: Association of weight and BMI in Visit I & III in Group-A (n=123)

Particulars	Visits	Mean	Std. Deviation	Paired t-test	p-value
1. Weight (in Kg)	Visit I	46.831	8.031	19.653	p<0.0001
	Visit III	49.205	7.724		
2. Body Mass Index	Visit I	20.859	2.780	21.361	p<0.0001
(BMI)	Visit III	21.916	2.499		

Table 3: Association of weight and BMI in Visit I & III in Group-B (n=80)

Particulars	Visits	Mean	Std. Deviation	Paired t-test	p-value
1. Weight (in Kg)	Visit I	53.82	10.029	13.872	p<0.0001
	Visit III	55.213	9.7929		
2. Body Mass Index	Visit I	21.904	3.570	14.409	p<0.0001
(BMI)	Visit III	22.474	3.461		

Table 4: Association of increase in weight and BMI amongst Group-A and Group-B

Particulars	Group	No.	Mean	Std. Deviation	Paired t-test	p-value
1. Weight (in Kg)	Group-A	123	2.376	1.3410	5.747	p<0.0001
	Group-B	80	1.396	0.9003		
2. Body Mass Index (BMI)	Group-A	123	1.057	0.549	7.050	p<0.0001
	Group-B	80	0.570	0.354		

Table 5: Comparison of underweight patients at visit I and visit III in group-A

Group -A	BMI at Visit I	BMI at Visit III	p-value
Less than or equal to 18.5	28 (23%)	5 (4%)	P=16.900
More than 18.5	95 (77%)	118 (96%)	d.f.=1
Total	123 (100%)	123 (100%)	<0.001

Table 6: Comparison of underweight patients at visit I and visit III in group-B

Group -B	BMI at Visit 1	BMI at Visit III	p-value
Less than or equal to 18.5	11 (14%)	9 (11%)	P=0.057
More than 18.5	16 (86%)	71 (89%)	d.f.=1
Total	80 (100%)	80 (100%)	<0.811

As seen from **Table** 6 at the visit I, in group B, 11 (14%) patients were underweight while at Visit III number decrease to 9 (11%) which is not statistically significant. It was observed that individual counseling is more effective than group counseling in underweight patients.

DISCUSSION

In India, HIV epidemic occurring in the population in which malnutrition is already endemic. In HIV positive patients with declining immune function has a direct and indirect impact on nutritional status (Fields-Gardner, 2004). The progressive decline in nutritional status is the result of a cumulative range of impacting factors that compound the problem of malnutrition (Blossnar, 2005; Trujillo *et al.*, 1992; Skurnick *et al.,* 1996; Tang *et al.,* 2005; Macallan, 1999 and Kotler *et al.,* 1989). If optimal nutritional status is not restored or maintained, a progressive cycle for people living with HIV can occur involving impaired immune function, increased risk of opportunistic infection, and increased nutritional needs (Blossnar, 2005, FANTA, F.A.N.T.A.P., HIV/AIDS2004).

During individual nutritional counseling, it is possible to emphasized importance of appropriate nutritional awareness about consumption of healthy food and good dietary practices and also symptom based nutritional counseling was done. Although the increase in mean weight and BMI in both groups were statistically significant, the increase in the individual nutritional counseling group was more than group nutritional counseling group. The underweight patients in both groups were counseled to increase energy contents of food by informing them to eat more frequently by adding snacks in between meals, increase size of portion during meals and add feed (oil, sugar etc.) to increase the energy content of dish. The patients with normal BMI and obese patients counseled for balance diet.

The individual counseling is more effective than group counseling in underweight patients and effect is statistically significant. The reason for failure to see statistically significant improvement in underweight patients in group counseling may be due to study design for short duration. In resource limited settings macronutrient supplementation to all HIV positive patients may not feasible. Poor nutritional knowledge and dietary practices therefore, play a key role in the rapid progression of HIV (FANTA, F.A.N.T.A.P., HIV/AIDS., 2004). The diet quality is an important determinant of HIV disease severity and mortality in ART-naive PLWHA (Rawat *et al.,* 2012). Knowledge of essential components of nutrition and incorporating them in nutritional interventional management goes long way in improving quality of life and better survival in HIV positive patients (Duggl *et al.,* 2012).

Conclusion

The various dietary interventions like group and individual counseling were effective in improving nutritional status (weight, BMI). The individual nutritional counseling was more effective in improving weight in underweight adults living with HIV infection than group nutritional counseling. The interventions geared at improving the nutritional practices are essential and may help in the prevention of rapid progression of HIV. There is need for dedicated dietician for every ART center, however in shortage of individual nutritional counseling services group counseling is effective

alternative. There is also need for further study of nutritional counseling with protein and micronutrients supplement and for long duration.

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REFERENCES

Henzel D, Niyongabo T, Melchior JC Bouchaud O and Larouzé B (1999). Comparison of methods for assessing nutritional status in HIV-infected adults. *Nutrition* **15**(10) 740-743.

Scrimshaw NS, Taylor CE and Gordon JE. (1968). Interactions of nutrition and infection. World Health Organization Geneva, Switzerland.

Walsh CM, Dannhauser A and Joubert G (2003). Impact of a nutrition education programme on nutrition knowledge and dietary practices of lower socioeconomic communities in the Free State and Northern Cape. *SAJCN* **16** 89-95.

Swaminathan S, Padmapriyadarsini C, Yoojin L, Sukumar B, Iliayas S and Karthipriya J (2010). Nutritional supplementation in HIV-infected individuals in South India: a prospective interventional study. Clinical Infect Disstance **51**(1) 51-57.

Mahungulu S, Grobler LA ,Visser ME and Volmink J (2007). Nutritional interventions for reducing morbidity and mortality in people with HIV. *Cochrane Database System Review* **18**(3) CD004536.

Fields-Gardner C and Fergusson P (2004). Position of the American Dietetic Association and Dietitians of Canada: nutrition intervention in the care of persons with human immunodeficiency virus infection. *Journal of the American Dietetic Association* **104**(9) 1425-1441.

Blossner M and De Onis M (2005). Malnutrition: quantifying the health impact at national and local levels. WHO *Environmental Burden of Disease Series* **12** 1-43.

Trujillo EB *et al.*, (1992). Assessment of nutritional status, nutrient intake, and nutrition support in AIDS patients. *Journal of the American Dietetic Association* **92**(4) 477-478.

Skurnick JH *et al.*, (1996). Micronutrient profiles in HIV-1-infected heterosexual adults. *Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology* **12**(1) 75-83.

Tang AM *et al.*, (2005). Increasing risk of 5% or greater unintentional weight loss in a cohort of HIV-infected patients, 1995 to 2003. *Journal Of Acquired Immune Deficiency Syndromes* **40**(1) 70-76.

Macallan DC (1999). Wasting in HIV infection and AIDS. *Journal of Nutrition* **129**(1 Supply) 238-242.

Kotler DP *et al.*, (1989). Magnitude of body-cell-mass depletion and the timing of death from wasting in AIDS. *American Journal of Clinical Nutrition* **50**(3) 444-447.

Rawat R, McCoy SI and Kadiyala S (2012). Poor diet quality is associated with low CD4 count and anemia and predicts mortality among antiretroviral therapy naive HIV-positive adults in Uganda. *Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology* **12**(1) 65-69.

FANTA, F.A.N.T.A.P., HIV/AIDS (2004). A Guide for Nutrition, Care and Support**.** Washington, DC, Academy for Educational Development 56.

Duggl S *et al.*, (2012). HIV and Malnutrition: effect on immune system, clinical developmental immunology **202** 740.