



DIETARY PRACTICES AND DIETARY NUTRIENT INTAKE OF PATIENTS UNDERGOING CARDIAC REHABILITATION PROGRAM

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ABSTRACT :

Cardiac rehabilitation programs are the most effective means of primary and secondary prevention of CVD. But they are underused in our country and very little information is available on the efficacy of the same on Indian patients. To assess the dietary practices and dietary nutrient intake among the cardiac patients undergoing Cardiac Rehabilitation Program. 51 cardiac patients enrolled for Cardiac Rehabilitation program at Asian Heart Institute (AHI) City Centre were selected using purposive sampling technique and were categorized into three groups based on the number of sessions attended. Post diet counseling information on dietary practices (24 hours diet recall and food frequency questionnaire) was collected and assessed for dietary nutrient consumption in comparison with RDA. Varied patterns of dietary nutrient intake were observed among the participants attending the rehabilitation program for different duration with those attending the program for a shorter period showing better dietary practices and dietary nutrient intake than the others. But overall, all the participants had included high fibre and protein-rich foods, antioxidant-rich vegetables and fruits, lean meat and fish in case of non-vegetarians, along with heart healthy foods like oats, nuts and flaxseed in their diets; and restricted sodium-containing foods and fried items. Intensive diet counseling post surgery has a positive impact on the dietary practices, and the nutritional status during Cardiac Rehabilitation Program.

Keywords- Cardiac Rehabilitation, dietary practices, dietary nutrient intake, diet counseling.

INTRODUCTION

Cardiac rehabilitation is assuming an increasingly important role in secondary prevention of CVD as it is not a short term change, but a lifelong lifestyle modification. In contrast with its growing importance internationally, there are very few cardiac rehabilitation centers in India at the present moment¹. As a result, very little information is available on the benefits of Indian Cardiac Rehabilitation programs. The present study aimed at evaluation of the effectiveness of Cardiac Rehabilitation programs on the modifiable cardiac risk factors in Indian population.

METHODOLOGY

51 male coronary heart disease (CHD) patients (45 to 80 years), enrolled in the Rehabilitation Program post surgery procedures (CABG/PTCA/ AVR/ pacemaker implantation) and; with minimum 3 existing cardiac risk factors were selected using purposive sampling technique from Asian Heart Institute (AHI) Cardiac Rehabilitation City Centre, Qi-Lifecare gymnasium, Churchgate (Mumbai). An informed consent as per AHI format was obtained from the patients. The participants were divided into three groups based on the number of exercise sessions they attended- Group-1 (12 sessions) (n=15), Group-2 (36 sessions) (n=19) and Group-3 (60 sessions) (n=17).

An standardized interview schedule was used to collect the information on general details

and current dietary practices. Information on dietary nutrient intake and dietary practices was collected using 24 hrs dietary recall and Food frequency questionnaire (FFQ)

A well-designed, highly supervised and individualized exercise protocol (aerobic and resistance training program) with an intensity of 50-85% HRmax or RPE-scale-11 to 13 (if the patient is on beta-blockers) was given to the participants on thrice a week basis. Duration of the exercise session was initially for aerobic session was around 15-20 mins, which was gradually increased and maintained at 45-60 mins (treadmill, stationary cycle, rower, elliptical cross trainer) depending on an individual's improvement. Light Resistance exercises for large muscle groups- shoulder, biceps, triceps, quadriceps, hamstring and calf muscles- alongwith few lower body stretches were prescribed. The data was analyzed using SPSS 16.0 version. Paired t-tests and ANOVA test were applied to the data wherever appropriate.

RESULTS AND DISCUSSION :

Results of the study indicate sustenance of the effect of diet counseling and/or compliance of the participants to the dietary advice received post discharge. Varied dietary practices and thereby nutrient intake was noticed among the participants (Table-1).

Table 1. Macronutrient intake among the participants

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	Reference values *	P-1 (n=15)	P-2 (n=19)	P-3 (n=17)	value
ENERGY (kcal/d)	2320	2058.7 ± 728.49	2128.1 ± 697.16	1623.9 ± 555.2	2.936
CHO (g/d)	348	312.93 ± 101.92	330.2 ± 148.35	223.1 ± 62.24	*4.557
FIBRE(g/d)	30	30.16 ± 10.15	24.72 ± 10.59	28.72 ± 10.87	1.230
PROTEIN (g/d)	60	63.64 ± 23.9	72.91 ± 31.09	52.42 ± 16.08	*3.061
TOTAL FAT (g/d)	50	49.65 ± 17.57	47.22 ± 15.27	41.65 ± 8.62	1.360
VISIBLE FAT (g/d)	25	18.8 ± 11.73	16.05 ± 6.14	19.68 ± 8.07	1.188

*level of significance: p ≤0.01; *ICMR (2010).
 The total energy, carbohydrate and total fat consumption was lower than their RDA in all the three groups with the third group showing the lowest intake. High dietary fibre intake with natural foods was associated with reductions in the cardiovascular risk factors. But, the dietary fiber intake was meeting the recommendation only in the first group. Energy-restricted high protein diet combined with resistant training were reported to help reduce CVD risk markers². The protein intake of the participants significantly varied across the groups (F=3.061, p ≤0.01) with the second group consuming the highest and the third group attending the program for the longest period consuming the lowest amount even below their RDA indicating low compatibility to the dietary advice.

The association of minerals with CVD and its risk factors is widely varied i.e. a positive association was noticed between higher serum calcium levels and CVD³, but serum ferritin concentrations associated positively with increased WHR and WC⁴. Zinc was found to be protective against CVD and cardiomyopathy⁵. All the participants met the RDA for calcium. However, they had significantly higher intake of phosphorus and magnesium (p ≤0.01). Low consumption of Sodium could be the result of an effective restriction of salt and sodium-rich foods. However, potassium and zinc were very low in the diet which could be a matter of concern. Surprisingly, consumption of iron and magnesium was found much higher than their RDA that might help maintain optimum body composition (Table 2).

Table 2. Mineral intake among the participants

	Reference values *	GROUP P-1 (n=15)	GROUP -2 (n=19)	GROUP P-3 (n=17)	f-value
CALCIUM (mg/dl)	600	654.5 ± 256.6	712.14 ± 280.38	607.29 ± 191.72	0.837
PHOSPHORUS (mg/dl)	600	1132 ± 532.68	1242.5 ± 618.51	716.03 ± 177.13	*5.68
IRON (mg/dl)	17	30.28 ± 13.04	32.72 ± 19.03	23.32 ± 8.14	2.013
SODIUM (mg/dl)	2100	1328.2 ± 900.32	966.2 ± 336.89	1264.9 ± 763.67	1.392
POTASSIUM (mg/dl)	3750	2012.8 ± 857.31	1929.3 ± 1131.98	1455.7 ± 634.46	1.816
MAGNESIUM (mg/dl)	240	445.7 ± 218.3	520.16 ± 300.32	326.94 ± 82.89	*3.9
ZINC (mg/dl)	12	8.63 ± 5.21	7.58 ± 4.24	6.9 ± 4.55	0.556

*level of significance: p ≤0.01; * ICMR (2010).
 High intake of foods rich in the antioxidants-ascorbic acid, beta-carotene, folic acid and vitamin B12 showed positive association with reduced levels of homocysteine, inflammation and oxidative stress^{6,7}. In the present study, the consumption of vitamin-A and vitamin-C rich foods was seen to be low. Though the participants were meeting RDA for vitamin B₁₂, folate consumption was very low (Table- 3).

Table 3. Vitamin intake among the participants

	Reference values *	GROUP P-1 (n=15)	GROUP -2 (n=19)	GROUP P-3 (n=17)	f-value
VIT-A (mcg/d)	600	567.2 ± 200.08	546.88 ± 228.05	501.62 ± 215.65	2.328
VIT-C (mg/d)	40	33.46 ± 13.36	36.4 ± 23.64	39.11 ± 18.91	1.143
VIT-B1 (mg/d)	1.2	2.35 ± 1.48	2.07 ± 1.36	1.4 ± 1	2.229
VIT-B2 (mg/d)	1.4	1.37 ± 0.92	1.86 ± 1.26	1.28 ± 0.95	1.549
VIT-B3 (mg/d)	16	9.94 ± 5.2	11.52 ± 7.3	6.37 ± 1.9	*4.223
FOLATE	200	105.7	111.73	84.99	1.

(mcg/d)		6 ± 32.79	± 55.05	± 36.31	82
VIT-B12 (mcg/d)	1	1.31 ± 0.7	1.4 ± 2.06	1.07 ± 0.81	26
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*level of significance: p ≤0.01; * ICMR (2010).

Milk protein which was found to be hypotensive consumption was found to be very good among the participants along with a fair intake of pulses and legumes which were reported to be useful in weight loss programs⁸. 52% of participants consumed oats and majority had a good consumption of vegetables and fruits, rich sources of fiber that was inversely associated with the incidence of CHD events and with CHD mortality. About half of the participants consumed flaxseed which is cardioprotective and red meat consumption was very low⁹.

CONCLUSION

Results of the study indicated an overall positive impact of the diet counseling and cardiac rehabilitation program on the dietary practices and dietary nutrient intake of CVD patients, which included consumption of high fibre and protein-rich foods, antioxidant-rich vegetables and fruits, lean meat and fish in case of non-vegetarians, along with heart healthy foods like oats, nuts and flaxseed, and restricted sodium-containing foods and fried items. However, there is a need for regular reinforcement of dietary advice to the patients in order to facilitate a positive impact of the program on their health.

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