



## Comparison of Adjuvant Therapy Ubiquinone V/S Krill Oil in Dilated Cardiomyopathy

### KEYWORDS

dilated cardiomyopathy, krill oil, ubiquinone.

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**ABSTRACT** Aim: To compare efficacy of ubiquinone with Krill oil in dilated cardiomyopathy

**Materials and Methods:** 60 diagnosed patients of dilated cardiomyopathy were divided in three groups of 20 patients each- Group I received conventional therapy while Group II and III received ubiquinone and krill oil respectively along with conventional therapy. Evaluation of subjects was done on three parameters- exercise tolerance, left ventricular function and clinical improvement. The treatment continued for 12 months and patient's baseline values (0 month) were compared with values at 6 and 12 month.

**Results:** Patients with adjuvant therapy with ubiquinone and Krill oil shows significant improvement in left ventricular function and clinical improvement while difference in improvement in exercise tolerance was insignificant.

**Conclusion:** Both Ubiquinone and Krill oil can be used as adjuvant therapy in dilated cardiomyopathy.

### INTRODUCTION

Dilated cardiomyopathy, a disorder of heart muscle, is the most common among different types of cardiomyopathies. DCM is the most prevalent but poorly understood disorder associated with sudden cardiac death.[1-4] Medical therapy remains the mainstay in these patients. [5] However clinical benefits vary among patients. With advances in therapeutics, adjuvant is added to the standard treatment.

CoQ10(Ubiquinone) is one such agent . Coenzyme Q10 is one of the most significant lipid antioxidants that prevents the generation of free radicals and modifications of proteins, lipids, and DNA.[6] CoQ10 has shown to improve survival in patients of CHF.[7]

Krill oil (a Sea food) is source of healthy omega-3 fatty acids, phospholipids and extremely potent antioxidants.[8] Supplementation with omega-3 polyunsaturated fatty acids improved left ventricular function in patients with mild-to-moderate chronic heart failure due to dilated cardiomyopathy.

Hence in our study we tried to compare the health benefits of krill oil with ubiquinone in patients of dilated cardiomyopathy by conducting an observational, open labelled one year study in diagnosed patients of dilated cardiomyopathy. [9]

### MATERIALS AND METHODS

The present study was conducted in 60 diagnosed patients of dilated cardiomyopathy in the department of pharmacology in collaboration with department of medicine at S.N.Medical College and Associated Hospital, Agra. Approval of institutional ethical committee was taken to conduct the above study.

60 diagnosed patients of dilated cardiomyopathy, after taking informed consent, were enrolled from Medicine OPD , cardiology OPD and Medicine wards over a period of four months. This selection was based on inclusion and exclusion criteria.

### Inclusion criteria:-

Ejection fraction of the left ventricle < 45% and/or fractional shortening < 25% (> 2 SD below the mean), as ascertained by echocardiography

Left-ventricular end-diastolic diameter > 117% of the predicted value corrected for age and body surface area, which corresponds to 2 SD above the predicted normal limit +5%.

### Exclusion criteria:-

1. Systemic hypertension (> 160/100 mm Hg)
2. Coronary artery disease (> 50% in one or more major branches)
3. Pericardial diseases
4. Congenital heart disease
5. Cor pulmonale
6. Rapid, sustained supraventricular tachycardia

The selected patients were divided into 3 groups of 20 patients each and were given for 12 months:

Group A: Conventional therapy

Group B: Conventional therapy+ CoQ10 100mg OD daily

Group C: Conventional therapy+ Krill oil 500mg OD daily

Patient baseline values (0month) were compared with the values at 6 and 12 months.

### Evaluation of the subjects was done by measuring :-

Exercise tolerance as measured by 6min walking distance.

Left ventricular function by echocardiography (mean ejection fraction in %).

Clinical improvement in terms of NYHA classification.

The end points of the study were improvement in NYHA class  $\geq 1$ ; 6 minute walk test improvement by  $\geq 100$  meters;

improvement in ejection fraction  $\geq 5\%$ .

### Statistics:-

Results were expressed as Mean  $\pm$  Standard deviation (SD). Statistical differences between the groups were tested by one way analysis of variance (ANOVA) followed by Tukey-Kramer Multiple Comparisons Test. For NYHA grad-

ing non parametric test, Friedman Test was used.

**RESULTS**

Out of 60 patients 58 successfully completed the study.

**Left ventricular function (measured by mean ejection fraction)**

The baseline value of MEF % (Mean ± SD) in different groups at 0 month were found to be statistically insignificant (p value >0.05). At 6 months, Mean ± SD of MEF% between the groups A and B were statistically significant ( p value < 0.05), while insignificant between group A and group C as well as group B and group C ( p value > 0.05 ). At 12 months, Mean ± SD between the groups A and B as well as groups A and C were statistically significant (p value < 0.001) ,while between the group B and group C was insignificant ( p value >0.05). (Table I)

**Exercise tolerance [measured by 6 minute walking distance (meters)]**

The baseline values of 6 Minute walking distance (Mean ± SD ) in different groups at 0 month, 6 month and 12 month were found to be statistically insignificant (p value >0.05). (Table II)

**Clinical improvement (NYHA CLASS)**

Our study shows that the improvement was maximum in group B (CoQ10 group) while Group C (krill oil group) shows considerable improvement. The grading as compared to Group A, were statistically significant (p<0.05). (Table III)

**DISCUSSION**

Dilated cardiomyopathy is the most common cardiomyopathy worldwide and a significant cause of morbidity and mortality. In patients of DCM, failing heart gradually results in left ventricular dilation and hypertrophy. Oxidative stress is increased, while CoQ10 levels are decreased. This has led to the hypothesis that CoQ10, an antioxidant, may decrease oxidative stress, impair remodeling, and improve cardiac function.[6] The American Heart Association recommends eating fish at least twice a week as part of their guidelines for reducing heart disease[10] With increasing consumption and dwindling resources of fish new sources are being identified. Krill is one such resource. Both cause significant improvement in parameters like MEF% and NYHA grading .

**CONCLUSION**

Both Ubiquinone and Krill oil can be used as adjuvant therapy in dilated cardiomyopathy.

**TABLES**

**TABLE I**  
**Mean Ejection Fraction(%) of different groups at 0 ,6month and 12 months**

	GROUP A (n=19)	GROUP B (n=19)	GROUP C (n=20)
0 months	26.27±2.79%	28.94± 3.29%	27.25±2.38%
6 months	26.57±2.77%	30.94± 3.47%*	28.85±3.42%
12months	27.78±3.31%	33.57±2.91%**	± 2.41%**

\*p < 0.05; \*\*p<0.001

**TABLE II**  
**6 minute walking distance (mts) of different groups at 0, 6 and 12 months**

	GROUP A (n=19)	GROUP B (n=19)	GROUP C (n=20)
0 months	275.63±68.03 mts	226.84±84.95 mts	222±62.14 mts
6 months	304.73±38.42 mts	296.84±60.55 mts	271±52.25 mts
12months	327.89±59.79 mts	337.10±62.32 mts	326.25±11.25 mts

**TABLE III**  
**Number of patients in NYHA class in different groups at 0, 6 and 12 months**

	GROUP A (n=19)			GROUP B (n=19)			GROUP C (n=20)		
	0 month	6 <sup>th</sup> month	12 <sup>th</sup> month	0 month	6 <sup>th</sup> month	12 <sup>th</sup> month	0 month	6 <sup>th</sup> month	12 <sup>th</sup> Month
NYHA CLASS I	-	-	-	-	-	6	-	-	3
NYHA CLASS II	11	11	13	9	14	10	13	13	15
NYHA CLASS III	7	8	6	8	5	3	6	6	2
NYHA CLASS IV	1	-	-	2	-	-	1	1	-

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