

Issues in Cardiovascular Health

Heart Failure and CoQ10: The Q-SYMBIO Trial

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Heart failure

A chronic condition in which the heart is weakened and can't pump enough blood to supply the body's organs¹

Symptoms²

- Severe fatigue
- Shortness of breath
- Swelling in legs and ankles
- Fluid buildup in the lungs

6.2 American adults with heart failure³
MILLION

1. American Heart Association web site. What is heart failure. Last reviewed 05/31/17. Accessed 12/10/20. <https://www.heart.org/en/health-topics/heart-failure/what-is-heart-failure> **2.** American Heart Association web site. Warning signs of heart failure. Last reviewed 05/31/17. Accessed 12/10/20. <https://www.heart.org/en/health-topics/heart-failure/warning-signs-of-heart-failure> **3.** Virani SS, et al. *Circulation*. 2020;141(9):e139-596.

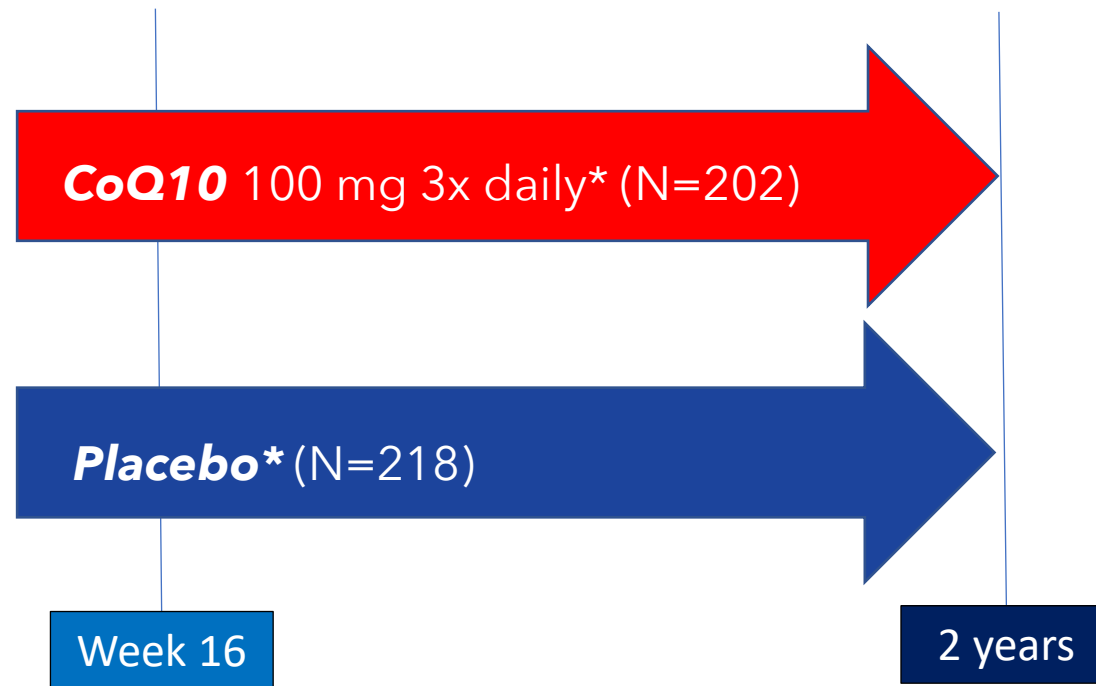
Q-SYMBIO

Coenzyme **Q**10 as an adjunctive treatment of chronic heart failure: a randomized, double-blind, multicenter trial with focus on **SYM**ptoms, **BI**omarker status [Brain-Natriuretic Peptide (BNP)], and long-term **O**utcomes (hospitalizations/mortality)

Study design

2-year prospective trial

Patients with moderate-to-severe heart failure



*Plus standard therapy.

Mortensen SA, et al. *JACC: Heart Failure*. 2014;2(6):641-649.

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Study endpoints

Primary short-term endpoints (Week 16)

- Changes in NYHA functional class
- 6-minute walk test
- Levels of N-terminal pro-B type natriuretic peptide (NT-proBNP)

Primary long-term endpoint (2 years)

Composite major adverse cardiovascular events (MACE)*
as determined by a time to first event analysis

Secondary long-term endpoints (2 years)

- Changes in NYHA functional class
- Levels of NT-proBNP
- Echocardiography
- Mortality

NYHA=New York Heart Association.

*Unplanned hospital stay for worsening heart failure, cardiovascular death, mechanical assist implantation, or urgent cardiac transplantation.

Mortensen SA, et al. *JACC: Heart Failure*. 2014;2(6):641-649.

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Results:

Short-term primary endpoints

- There were improvements in NYHA functional class and 6-minute walk test in both treatment groups (differences between groups were not statistically different)
- Between-group changes in serum NT-proBNP from baseline to week 16 were not significantly different*

NYHA=New York Heart Association; NT-proBNP=N-terminal pro-B type natriuretic peptide.

*There was a trend with a mean reduction of 384 pg/ml (20%) of NT-proBNP in the CoQ10 group and a proportional rise of 199 pg/ml (12%) of NT-proBNP in the placebo group.

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Results:

Long-term primary endpoint

43% relative reduction in major adverse cardiovascular events (MACE), $P=0.005$

MACE	Placebo (n=218)	CoQ10 (n=202)
Death from MI	3	2
Death from HF	10	1
Sudden cardiac death	13	9
Hospital stay for worsening HF	24	12
Hospital stay for acute HF	5	3
Hospital stay for acute HF + IABP	2	2
LVAD	0	1
TOTAL	57 (26%)	30 (15%)*

* $P=0.005$ for total.

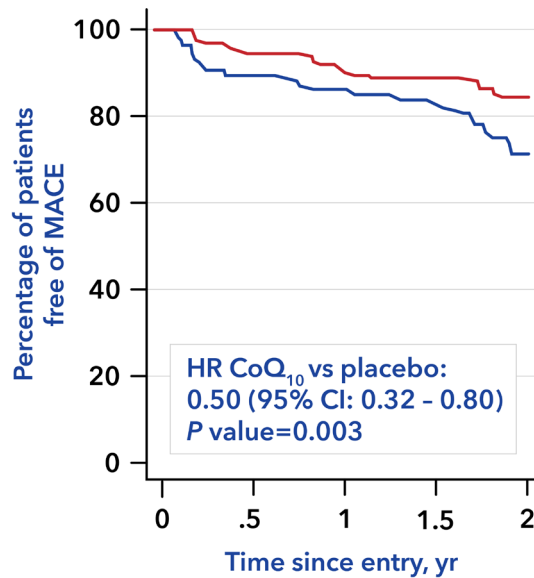
IABP=intra-aortic balloon pumping; LVAD= left ventricular assist device; MI=myocardial infarction; HF=heart failure.

Mortensen SA, et al. *JACC: Heart Failure*. 2014;2(6):641-649.

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Kaplan-Meier estimate of the time to the primary and a secondary endpoint

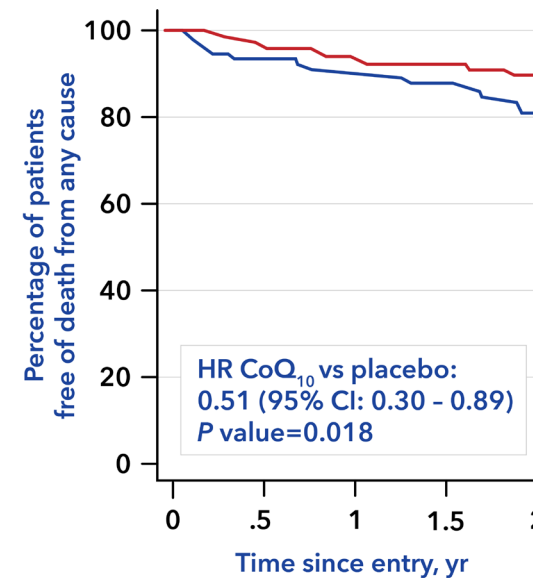
Time to the primary endpoint of composite MACE*
($P=0.003$)



Number at risk

CoQ ₁₀	202	179	154	147	138
Placebo	218	180	162	150	127

Time to the specified secondary outcome of death from any cause† ($P=0.018$)



Number at risk

CoQ ₁₀	202	185	169	163	156
Placebo	218	191	179	168	154

CI=confidence interval; HR=hazard ratio. *Unplanned hospital stay for worsening heart failure, cardiovascular death, mechanical assist implantation, or urgent cardiac transplantation; a time to first event analysis. †All-cause mortality was lower in the CoQ10 group (21 deaths [10%]) vs the placebo group (39 [18%]). Mortensen SA, et al. *JACC: Heart Failure*. 2014;2(6):641-649.

Results:

Other long-term secondary endpoints

- The CoQ10 group showed a greater proportion of patients with improved NYHA functional classification (N=86; 58%) compared with the placebo group (N=68; 45%); ($P=0.028$)
 - An improvement of at least 1 grade in NYHA functional class
- No significant between-group differences in echocardiographic measurements or reductions from baseline in serum NT-proBNP
- Cardiovascular mortality was significantly lower in the CoQ10 group vs placebo (9% vs 16%, $P=0.026$)
- Incidence of hospital stays for heart failure was significantly lower in the CoQ10 group vs placebo ($P=0.033$)

Safety

Adverse events

- The number of adverse events tended to be lower in the CoQ10 group compared with the placebo group, 26 (13%) versus 41 (19%), respectively ($P=0.110$)

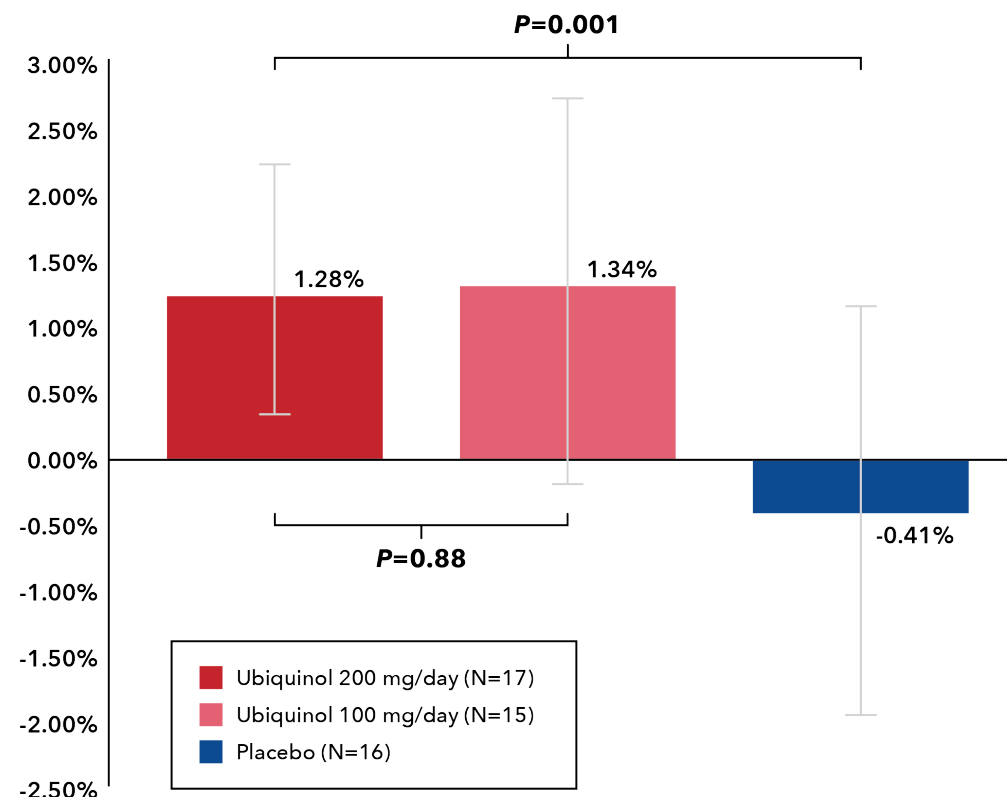
A building body of evidence suggests that CoQ10/ubiquinol may help maintain CV health

Ubiquinol, the active form of CoQ10, significantly improves endothelial function after 8 weeks in healthy patients with mild-to-moderate dyslipidemia ($P=0.001$)

*Response with ubiquinol was dose-independent.

†No significant changes in plasma lipid profile between groups or versus baseline for either group (one-way ANOVA, $P=0.905$). Ubiquinol improved endothelium-dependent vasodilation independent of plasma cholesterol levels.

Primary endpoint: improvement in flow-mediated dilation (FMD)*†



CoQ10 use in patients with heart failure

Long-term adjunctive CoQ10 administration (in addition to standard drug therapy) of patients with chronic heart failure is safe, reduces symptoms, and drops the rate of major adverse cardiovascular events.

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