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734-5 Effect of Warfarin Anticoagulation on Survival in Patients With Left Ventricular Systolic Dysfunction

Ayman S. Al-Khadra, Deeb N. Salem, William M. Rand, James E. Udelson, John J. Smith, Marvin A. Konstam. *NEMC — Tufts University, Boston, MA*

Relative risk (RR) and confidence interval (CI) for warfarin users vs. non-users

Endpoint	RR	95% CI	P
All cause mortality	0.76	0.65–0.91	0.0006
Cardiac deaths	0.72	0.61–0.86	0.0002
Death due to heart failure (HF)	0.77	0.61–0.98	0.03
Cardiac death not due to HF	0.66	0.47–0.91	0.01
Fatal MI	0.55	0.34–0.90	0.02

The impact of warfarin therapy on survival in patients with chronic heart failure or LV systolic dysfunction is unknown. We analyzed survival in relation to warfarin therapy in 6787 patients with LV EF ≤ 0.35 enrolled in the SOLVD trial. Mean follow-up was approximately 40 months. Patients receiving warfarin (13.3%, n = 906) had lower mean EF, lower rate of antiplatelet agents use, and worse NYHA class, and higher prevalence of atrial fibrillation, antiarrhythmic agents and digoxin use, cerebrovascular disease, and non-ishemic LV dysfunction (all $P < 0.05$). There was no difference in study drug (enalapril) randomization. After adjusting for these differences and for age, sex and trial assignment (prevention vs. treatment trial), using Cox proportional hazard model, anticoagulation emerged as a significant predictor of favorable outcome and was associated with 24% relative risk reduction in all-cause mortality (95% CI 11% to 35%, $P = 0.0006$). Anticoagulation was associated with reduction in cardiac mortality, including mortality due to fatal MI, sudden death and heart failure.

The reduction in all cause mortality was present in all subgroups based on trial assignment, randomization to enalapril, underlying etiology and presence of atrial fibrillation. There was no interaction between the effect of warfarin and age or EF.

Conclusion: Warfarin anticoagulation in patients with LV systolic dysfunction is associated with improved survival regardless of etiology, symptom class, or EF.

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734-6 A 25-Year Experience in Patients (Pts) With Coronary Artery Disease (CAD) and Chronic Heart Failure (CHF): Outcomes With Medical Therapy and Bypass Surgery (CABG)

Christopher M. O'Connor, Joseph A. Puma, Laura H. Gardner, Robert M. Califf, Robert H. Jones. *Duke University Medical Center, Durham, NC*

Recent advances in the medical management of pts with CAD and CHF have led us to re-examine the role of revascularization. To determine the effects of CABG in these pts, we prospectively collected data on 33,581 consecutive pts undergoing cardiac catheterization between 1969 and 1994. Of those pts with ejection fractions < 40% and Class II–IV CHF, 1,088 were treated medically and 354 with CABG.

Baseline characteristics were similar in both groups except for more 3-vessel disease (67% vs. 50%) and prior myocardial infarctions (88% vs. 76%) in the CABG group, and more moderate or severe mitral regurgitation (16% vs. 9%) in the medical group. Angina within 6 weeks of angiography was reported in 68% of medical pts and 71% of CABG pts. Long term outcome revealed:

Unadjusted Kaplan-Meier Survival Estimates

	Medicine	CABG	p-Value
1 year (%)	71	77	0.17
5 years (%)	35	55	0.0001
10 years (%)	15	35	0.0001

There was a comparable 5 year survival advantage in the CABG cohort compared to the medical cohort in pts with angina (56% vs 26%) and without angina (52% vs 29%) respectively. Conclusion: Pts with clinical CHF and CAD have improved survival with CABG which is not altered by the absence of anginal symptoms.

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Tuesday, March 26, 1996, 8:30 a.m.–10:00 a.m.
Orange County Convention Center, Room 222

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735-1 Late Recovery of Left Ventricular Dysfunction After Mitral Repair: Predictive Value of Preoperative Exercise Echocardiography

Dominic Y. Leung, Brian P. Griffin, William J. Stewart, Brian Haluska, Delos Cosgrove, James D. Thomas, Thomas H. Marwick. *Cleveland Clinic Foundation. Cleveland, Ohio*

Left ventricular (LV) dysfunction *early* after valve repair for mitral regurgitation (MR) correlated better with preoperative (preop) exercise (Ex) than resting indices of LV function. However, whether early LV dysfunction is reversible and the role of preoperative echo in identifying late recovery are unclear. We performed Ex echo in 67 pts (age 53 ± 13 yrs, 50 men, 49 in functional class (FC) I and 18 FC II) without coronary disease undergoing repair for isolated MR. Pts underwent resting echo before discharge and > 1 year later. *Results:* Resting ejection fraction (EF) decreased from 64 ± 9% preop to 54 ± 10% *early* after uncomplicated mitral repair ($p < 0.001$). Early post repair, 17 pts (25%) developed LV dysfunction with EF < 50%. Late follow up echo was obtained in 28 pts (mean 1.7 yrs post repair): 19 of the 28 pts with early post repair EF ≥ 50% remained in FC I and had resting EF ≥ 50%. For the remaining 9 pts with early post repair EF < 50%, late follow up showed recovery of LV function (EF ≥ 50%) in 5 and no recovery in 4 (EF < 50%). Late EF was correlated with preop ESV_{Ex} ($p = 0.002$) and Ex EF ($p = 0.001$). Pts with late recovery, compared to pts without, were younger (44 ± 11 vs 65 ± 7 years, $p = 0.01$), had a higher preop Ex EF (63 ± 10% vs 46 ± 8%, $p = 0.03$) and a lower resting end systolic wall stress ($p = 0.09$). There was no difference in preop resting EF, dp/dt, ESD_{Rest}, ESV_{Ex} and early post repair EF between the 2 groups. *Conclusions:* 1) LV dysfunction early post repair is often reversible, 2) Preop Ex index measured as Ex EF are helpful in predicting late recovery, 3) Ex echo, by identifying pts with latent LV dysfunction, may allow early surgery for these pts and may improve long term outcome.

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735-2 Lack of Improvement in Exercise Duration or Functional Status After Valve Replacement for Aortic Stenosis

Brad Munt, Malcolm Legget, Michelle Fujioka, Rebecca Schwaegler, Nancy Healy, Catherine Otto. *University of Washington, Seattle, WA*

Although the survival advantage of valve replacement (AVR) for symptomatic aortic stenosis (AS) has been well-documented, there is little data on changes in exercise tolerance or functional status post-AVR. Late improvement post-AVR might be expected if diastolic function abnormalities persist early post-AVR. Thus, we compared pre- and post-AVR echocardiographic, exercise, and functional status data in 29 adults (mean age 66 ± 15 yrs) enrolled in a prospective study of AS with annual follow-up. A pre-AVR echocardiogram (n = 29) and exercise test (n = 19) was performed 4 ± 3 months pre-AVR (before the onset of symptoms) with the early post-AVR study performed 12 months later in all 29 pts. In 19 pts a late post-AVR study was performed 2 years later.

As expected, maximum jet velocity (4.6 ± 0.6 to 2.8 ± 0.7 m/s, $p < 0.001$) and mean gradient decreased (53 ± 15 to 19 ± 10 mmHg, $p < 0.001$), and valve area increased (0.9 ± 0.4 to 1.8 ± 0.8 cm^2, $p < 0.001$). In addition, ejection fraction increased from 61 ± 17 to 67 ± 10% ($p = 0.05$) and LV-mass decreased from 164 ± 49 to 136 ± 33 gm ($p = 0.003$) with persistance of these changes on the late post-AVR study. The mitral E/A ratio (1.2 ± 0.6 to 1.3 ± 0.7) and deceleration slope (3.0 ± 1.7 to 3.7 ± 2.3 m/s^2) were unchanged (p = NS) at both the early and late post-AVR studies. Standard Bruce protocol exercise duration was 4.3 ± 2.6 min pre-AVR vs 4.4 ± 1.9 min post-AVR (p = NS). The functional status score based on a standard questionnaire of daily activities [ranging from 0 (worse) to 100% (best)] also was unchanged (90 ± 12 to 90 ± 11%, p = NS).

We conclude that when AVR is performed promptly at symptom onset, despite improved LV systolic function and decreased LV mass, there is no objective change in diastolic function, exercise tolerance, or functional status.

TUESDAY ORAL