Cardiac Function and Heart Failure

9:30 a.m.

837-5   **New Onset Heart Failure in the Community: One- and Three-Year Mortality and Risk Factors for 90-Day Mortality**

Federica De Giuli, Kay-Tee Khaw, Philip A. Poole-Wilson, S. Maugeri Foundation IRCCS, Gussago (BS), Italy, University of Cambridge, Cambridge, United Kingdom

The aim of the study was to estimate survival and prognostic factors for 90-day mortality in patients with new diagnosis of heart failure (HF) made by GPs in a population of 696884 people in the UK.
Methods: The General Practice Research Database records data of people registered with 525 GPs in the UK. This project analyses the data of patients ($\geq$45 y) observed from 1991 to 1994. Incident cases of HF (5006 men, 9044 women) were selected by reviewing the whole list of cardiovascular diagnoses and identifying those with a definite stated diagnosis of HF.
Results: The mean ($\pm$SD) age in men and women was: 75 y (9) and 79 y (9). 1-y and 3-y cumulative probabilities of dying were 31% and 50 %, respectively. Survival curves were not linear showing a higher mortality in the first 90 days after diagnosis of HF. 18.4% of patients died within 90 days after HF diagnosis. The logistics regression analysis showed that age, first diagnosis made in hospital, diagnosis of "acute" HF, and concomitant and previous diagnosis of ischaemic heart disease, hypertension and atrial fibrillation - but not gender neither concomitant and previous diagnosis of diabetes and COPD - were prognostic factors for dying within 90 days from the diagnosis of HF. These data show that patients with a new diagnosis of HF made by GPs are severe cases and are affected by high mortality in the first 90 days after diagnosis as demonstrated in previous studies conducted in patients with HF diagnosis made according to strict criteria. Gender and diabetes – that are usual prognostic factors for long-term mortality in HF patients – do not seem to affect 90-day mortality in this population.

9:45 a.m.

837-6   **Decreasing One-Year Mortality From Heart Failure in Sweden: Data From the Swedish Hospital Discharge Registry-1988 to 2000**

Karl Swedberg, Max Köster, Måns Rosén, Maria Schaufelberger, Annika Rosengren, Sahlgrenska University Hospital/Östra, Göteborg, Sweden, National Board of Health and Welfare, Stockholm, Sweden

Background: In the last 10-15 years several treatment modalities have demonstrated improved prognosis in heart failure in selected study populations. Little is known whether this has translated into improved prognosis for the patient population at large. We conducted a survey of trends in 1-year prognosis of patients treated for heart failure in Sweden over the years 1988 to 2000.
Methods: Data from the Swedish Hospital Discharge and the Swedish Cause of Death registers were used. The study population consisted of all patients aged 55 to 84 (n=140,087) discharged with a principal diagnosis of heart failure from any Swedish hospital in 19 Swedish counties (80 per cent of the Swedish population) with complete coverage over the period 1988 to 2000.
Results:

One-year Mortality %

Age cohort	1988	2000	% decrease
55-64	30	14	53
65-74	36	20	44
75-84	46	31	33

The decrease was particularly evident from 1994-95.
The reduction in mortality was probably not due to milder cases being admitted since admissions for heart failure also decreased during the period.
Conclusion : One-year survival after hospital discharge for heart failure has improved markedly during the last decade. The improvement coincides with the establishment of ACE-inhibitors and beta-blockers as beneficial pharmacological therapies. These benefits may now also translate into non-study populations.

ORAL CONTRIBUTIONS

838   Exercise Testing: Predicting Mortality

Tuesday, April 01, 2003, 8:30 a.m.-10:00 a.m.
McCormick Place, Room S402

8:30 a.m.

838-1   **Early Repolarization, Heart Rate Recovery, and Risk of Death**

Gian M. Novaro, Eugene H. Blackstone, Claire E. Pothier, Michael S. Lauer, The Cleveland Clinic Foundation, Cleveland, OH

Background: Early repolarization (EREPOL) has been associated with improved autonomic balance and better prognosis. Heart rate recovery (HRR) after exercise is a marker of parasympathetic tone. The associations of EREPOL with HRR and risk of death after accounting for HRR is not known.
Methods: We followed 24,511 patients referred for treadmill exercise testing and who did not have heart failure, atrial fibrillation, valve disease, pacemakers, Q waves, bundle branch block, or ECG LV hypertrophy. We used propensity analysis to account for differences in baseline characteristics.
Results: EREPOL was present in 1424 patients (6%), who were younger (47 vs 55 years, P < 0.0001) and more likely to be men (89% vs 68%, P < 0.0001). They were less likely to have an abnormal HRR (10% vs 20%, P < 0.0001) and to manifest impaired physical fitness (16% vs 26%, P < 0.0001). We successfully matched 1419 of these patients to 1419 patients without EREPOL on 39 variables. In this propensity-matched population, the overall mortality rate was low, with 89 deaths (3%) during 6.5 years. EREPOL was associated with a lower risk (Figure).
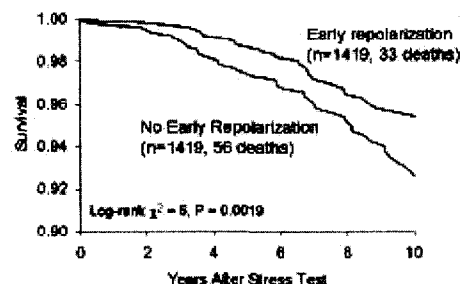
After adjusting for propensity score, age, gender, HRR, and functional capacity, EREPOL was marginally associated with lower risk (adjusted hazard ratio 0.65, 95% CI 0.42-1.00, P=0.05).
Conclusions: Among patients referred for exercise testing, EREPOL is associated with a favorable risk profile and a lower likelihood of an abnormal HRR. As an independent marker, it is weakly predictive of lower risk.

8:45 a.m.

838-2   **The Incremental Prognostic Value of the Chronotropic Index and Impaired Heart Rate Recovery for Prediction of Cardiac Death**

Babak Azarbal, Sean W. Hayes, Rory Hachamovitch, Daniel S. Berman, Cedars-Sinai Medical Center, Los Angeles, CA

Background: Impaired heart rate (HR) response to exercise, measured by the chronotropic index (CI), and abnormal heart rate recovery (HRR) are known predictors of cardiac death (CD). We examined whether CI and HRR add incremental value for predicting CD in pts undergoing exercise myocardial perfusion SPECT (MPS).
Methods: 10,830 consecutive pts with no valvular disease and not on β blockers underwent symptom-limited exercise MPS; 609 pts were censored for early revascularization (<60 days). CI was defined as (peak HR – rest HR)/(220-age-rest HR), with CI<0.8 defined as low. HRR was defined as peak HR - recovery HR. A HRR $\leq$ 22 bpm at 2 min post peak exercise was considered abnormal. Analysis was performed using survival modeling.
Results: There were 93 CD during a mean follow-up of 719 $\pm$ 252 days (98% complete). Of 10,021 pts, 1753 (17.5%) had abnormal HRR, 2956 (29.5%) had low CI, and 733 (24.8%) had both. In a multivariate model of all univariate predictors of CD, the independent predictors were MPS extent/severity, $\chi=54.0$; age, $\chi=23.3$; CI, $\chi=10.6$; HRR, $\chi=5.2$. The figure shows the observed relationship between CI, 2 min HRR, and CD. At 2 yrs, pts with normal CI and HRR (A) had a very low risk of CD (0.4%). Pts with either an abnormal HRR (B) or a low CI (C) had increased risk for CD (1.2% and 1.3%, respectively), and pts with both an abnormal HRR and a low CI (D) carried the highest risk for