This analysis of data from >3 million US beneficiaries aged ≥65 years attending 4767 hospitals found that the risks for death out to 90 days were 11, 8 and 10 times greater than the general older population. i) the daily change in risk of death had declined by 95% by days 21, 19 and 21; and ii) the magnitudes of the relative risks for hospital admission out to 90 days were 8, 6 and 6 times greater than the general older population; iii) the risks of death had declined by 50% by days 11, 6 and 10; iv) the daily change in risk of first readmission had declined by 95% by days 45, 38 and 45; and v) the magnitudes of the relative risks for death out to 90 days were 11, 8 and 10 times greater than the general older population.

Summary:

Trajectories of risk after hospitalization for heart failure, acute myocardial infarction, or pneumonia

Authors: Dharmarajan K et al.

Comment: This review examined the outcomes of over 3 million elderly Medicare patients admitted to hospitals in the US with one of 3 diagnoses: acute decompensated HF, acute MI or pneumonia. Not surprisingly, patients admitted with acute decompensated HF had the worst outcomes; however, all 3 cohorts had high rates of readmission and mortality over subsequent months. The review highlights the need for close vigilance of elderly patients during this high-risk period postdischarge from hospital. These data reinforce the rationale for enrolling patients with acute decompensated HF in multidisciplinary care programmes prior to discharge from hospital.

Reference: BMJ 2015;350:h411

Abstract

Independent commentary by Professor Peter Macdonald.

Peter Macdonald is a Conjoint Professor of Medicine in the University of New South Wales, senior staff cardiologist in the Heart & Lung Transplant Unit at St Vincent’s Hospital, Sydney and co-head of the Transplantation Research Laboratory at the Victor Chang Cardiac Research Institute. He is a past President of the Transplantation Society of Australia & New Zealand (TSANZ). His major research interests over the last 20 years have been in the areas of heart failure, pulmonary hypertension, transplant allograft rejection, donor management and organ preservation. He has published six national guidelines, 15 book chapters and over 200 peer-reviewed scientific papers.
Heart failure with preserved ejection fraction: refocusing on diastole

Authors: Abbate A et al.

Summary: This was a review on the inherent challenges associated with the use of diagnostic criteria for HFPEF, differential diagnosis, prognostic evaluation and treatment, and it highlighted the need for more research in these areas. The authors also highlighted that differentiating HFPEF requires evidence of an abnormal diastolic function, and the importance of differentiating HFPEF from other cardiac and noncardiac conditions.

Comment: HFPEF remains a challenge at multiple levels. This publication by Abbate and co-authors from Richmond, Virginia, reviewed the definition, clinical manifestations, proposed pathophysiology, diagnostic and therapeutic approaches, and prognosis of HFPEF. There is a growing list of drugs that have been tested in large clinical trials, but as yet none have been found to improve survival. Several more are in the pipeline; however, for the time being treatment remains empirical and aimed at symptom control. This review is recommended for those looking for a ‘state of the art’ overview of this therapeutic conundrum.

Reference: Int J Cardiol 2015;179:430–40

Reverse epidemiology in different stages of heart failure

Authors: Güder G et al., on behalf of the Competence Network Heart Failure Germany

Summary: This was an analysis of data pooled from four cohort studies with patients staged according to ACC/AHA-criteria: 218 were stage A, 1324 were stage B, 1134 were stage C1 (NYHA class I–II) and 639 were stage C2/D (NYHA class III–IV). The researchers found that as HF severity increased through the respective stages, median age increased (63, 67, 67 and 70 years), while decreases were seen in the proportions of females (56%, 52%, 37% and 35%), mean BMI (26.1, 28.8, 27.7 and 26.6 kg/m²), total cholesterol level (212, 204, 191 and 172 mg/dl) and systolic BP (140, 148, 130 and 120 mm Hg). These results are encouraging; however, it is noteworthy that the investigators excluded 413 of those with HF with stage B who were not receiving digoxin. This Italian single-centre retrospective review of the use of digoxin in patients with AF with or without chronic HF casts some doubt on the guideline recommendation. The authors found that the use of digoxin was associated with increased mortality both in those with and without HF. Digoxin use was higher in patients with HF, which is to be expected. Significant limitations of the study as acknowledged by the authors were that serum digoxin concentrations and renal function were not systematically measured in their cohort.

Reference: Int J Cardiol 2015;180:1–5

The long-term effects of dietary sodium restriction on clinical outcomes in patients with heart failure

Authors: Colin-Ramirez E et al.

Summary: The SODIUM-HF (Study of Dietary Intervention Under 100 mmol in Heart Failure) pilot study randomised patients with HF (NYHA classes II–III) to a diet with a low (1500 mg/day; n=19) or moderate (2300 mg/day; n=19) sodium content. Declines in median sodium intake were seen from 2137 to 1396 and 2678 to 1461 mg/day at 6 months in the low and moderate sodium arms, respectively. The low sodium diet was also associated with a significant decline in BNP level and a significant improvement in QOL as assessed by the KCCQ (Kansas City Cardiomyopathy Questionnaire) at 6 months, whereas changes in these parameters were not statistically significant with the moderate sodium diet. A post hoc analysis revealed associations between sodium intake of ≤1500 mg/day and improvements in BNP levels and KCCQ scores.

Comment: Restriction of salt (and fluid) in patients with HF is one of the ‘mantras’ of nonpharmacological management of HF. All current HF guidelines recommend salt restriction; however, there are surprisingly little prospective clinical trial data to support this recommendation. In this pilot to a presumably much larger planned study of sodium restriction in HF, these authors from Canada randomised 38 patients to a low versus moderate sodium diet and compared their outcomes at 6 months. Both intervention groups achieved impressive reductions in sodium intake, although only the low sodium group achieved significant lowering of BNP level and improvement in QOL. These pilot results are encouraging; however, it is noteworthy that the investigators excluded 413 of 451 patients with HF that they screened for the study. This raises a question regarding generalisability of their findings.

Reference: Am Heart J 2015;169(2):274–81

Obesity and the obesity paradox in heart failure

Authors: Gupta PP et al.

Summary: These authors reviewed data on the obesity paradox seen in patients with HF, and discussed the reliability of identifying obesity with BMI. Newer studies exploring the use of other measures of bodyfat and body composition were also reviewed, as was the relationship between the obesity paradox and cardioregenerative fitness in patients with HF. The authors also explored various possible explanations for the obesity paradox, and summarised use of other measures of bodyfat and body composition were also reviewed, as was the proposed pathophysiology, diagnostic and therapeutic approaches, and prognosis of HFPEF. There is a growing list of drugs that have been tested in large clinical trials, but as yet none have been found to improve survival. Several more are in the pipeline; however, for the time being treatment remains empirical and aimed at symptom control. This review is recommended for those looking for a ‘state of the art’ overview of this therapeutic conundrum.

Reference: Int J Cardiol; Published online Feb 10, 2015

Digoxin treatment is associated with increased total and cardiovascular mortality in anticoagulated patients with atrial fibrillation

Authors: Pastori D et al.

Summary: These researchers prospectively explored the relationship between digoxin use and mortality in 815 consecutive patients with nonvalvular AF treated with vitamin K antagonists and followed for a median 33.2 months (2460 person-years). Compared with participants not receiving digoxin, those who were receiving digoxin (n=171) were older, had a clinical history of HF and were at higher risk of a thromboembolic event. Time spent in therapeutic range did not differ between digoxin recipients and nonrecipients, but digoxin recipients had a significantly greater total mortality rate (p<0.001). A multivariable analysis showed that digoxin use was significantly associated with total and CV-related mortality (respective HRs 2.224 [p<0.001] and 4.686 [p<0.001]); these associations were confirmed in a propensity score-matched analysis.

Comment: The latest (2011) edition of the CSANZ/NHF guidelines for the management of HF recommends that ‘digoxin may be considered for symptom relief and to reduce hospitalisation in patients with advanced chronic HF’ and that ‘it remains a valuable therapy in chronic HF patients with AF’. This Italian single-centre retrospective review of the use of digoxin in patients with AF with or without chronic HF casts some doubt on the guideline recommendation. The authors found that the use of digoxin was associated with increased mortality both in those with and without HF. Digoxin use was higher in patients with HF, which is to be expected. Significant limitations of the study as acknowledged by the authors were that serum digoxin concentrations and renal function were not systematically measured in their cohort.

Heart Failure Research Review

In post-MI heart failure protection comes as standard

† In patients with heart failure and left ventricular impairment within 3–14 days of acute myocardial infarction, in combination with standard therapy.

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Coronary microvascular rarefaction and myocardial fibrosis in heart failure with preserved ejection fraction

Authors: Mohammed SF et al.

Summary: These researchers compared autopsy findings from 124 patients with HFPEF with those of 104 age-appropriate control subjects with no HF diagnosis and who died of noncardiac causes. They found that compared with controls, patients with the microvascular disease had: i) a greater median heart weight (538 vs. 335g, or 169% vs. 112% of age, sex- and body size–expected values [p<0.0001]); ii) more CAD, with a greater proportion with >1 vessel with >50% diameter stenosis (65% vs. 13% [p<0.0001]); iii) a greater median area of left ventricular fibrosis (9.6% vs. 7.1% [p<0.0001]); and iv) lower microvascular density (961 vs. 1316 vessels/mm2 [p=0.0001]). Myocardial fibrosis increased as microvascular density decreased in patients with HFPEF and controls (respectively r values −0.26 and −0.28 [p=0.004 for both]), and the group differences in fibrosis were attenuated after adjustment for microvascular density. HFPEF patients with CAD had similar heart weights, fibrosis and microvascular densities to those without CAD.

Comment: In this detailed autopsy study of patients who died with an ante mortem diagnosis of HFPEF, the authors found that compared with age-matched controls dying from noncardiac causes, the hearts of HFPEF patients were heavier with evidence of both gross and microscopic myocardial hypertrophy and fibrosis. Hearts from HFPEF patients also had quantitatively more epicardial coronary artery and microvascular disease. The latter was manifested as reduced microvascular density, suggesting microvascular dysfunction leading to ischaemia and subsequent fibrosis. Several authors have recently proposed that microvascular endothelial inflammation may be a common pathway by which multiple different comorbidities trigger microvascular rarefaction and fibrosis.


Abstract

Mini-Cog performance: novel marker of post discharge risk among patients hospitalized for heart failure

Authors: Patel A et al.

Summary: The relationships between cognitive impairment and the risks of readmission and mortality were evaluated in 720 consecutive patients hospitalized for HF; cognitive impairment, as assessed using Mini-Cog, was present in 23%. The respective 6-month readmission and mortality rates were 48% and 3%. Poor Mini-Cog performance independently predicted the composite outcome of time between hospital discharge and first occurrence of readmission or mortality (adjusted HR 1.90 [95 CI 1.47–2.44; p<0.0001]) and was the most important predictive factor of 55 variables. The accuracy and risk reclassification of risk models were significantly improved by the inclusion of Mini-Cog performance.

A secondary analysis of the initial 30 days postdischarge showed that discharge venue modified the effect, with patients with cognitive impairment discharged to a facility having longer time to outcome than those discharged home.

Comment: "Real world" HF patients are typically elderly and physically frail with multiple comorbidities. They usually have a high pill burden. Given this clinical picture, it is not surprising that those with cognitive impairment fare worse than those with intact higher cortical function. Multiple tests of cognition have been developed, with the best known examples being the MMSE (Mini mental state examination) and the MOCA (Montreal Cognitive Assessment). In this study, the authors used a simplified screening instrument called the Mini-Cog designed for "ultrashort" cognitive assessment. The instrument uses a three-item recall question and a clock drawing task. It takes 3 minutes to complete. They applied this to a large cohort of patients hospitalised with HF and found it to be a reliable predictor of increased postdischarge morbidity and mortality. The important take-home message is that cognitive assessment should be a routine part of the evaluation of any HF patient.

Reference: Circ Heart Fail 2015;8(1):8–16

Abstract

Exercise training in patients with heart failure and preserved ejection fraction

Authors: Pandey A et al.

Summary: This meta-analysis of six randomised controlled trials (n=276) found that compared with control groups, exercise training was associated with significantly improved cardiorespiratory fitness (weighted mean difference 2.72 [95% CI 1.79–3.65]) and QOL (–3.97 [–7.21 to –0.72]) in patients with HFPEF, but had no significant effect on systolic or diastolic function.

Comment: This meta-analysis of randomised controlled trials of exercise training in patients with HFPEF highlights the limited evidence base that is currently available − only 276 patients enrolled across six trials. In all studies, the intervention was between 3 and 6 months − too short a period to assess any impact of exercise training on the hard endpoints of mortality or hospitalisation. Nonetheless, this review suggests that exercise training is safe and effective in improving exercise capacity and QOL in HFPEF patients − both worthwhile clinical outcomes.

Reference: Circ Heart Fail 2015;8(1):33–40

Abstract

Risk of heart failure among postmenopausal women.

A secondary analysis of the randomized trial of vitamin D plus calcium of the women’s health initiative

Authors: Dorneyong MM et al.

Summary: This was a secondary analysis of 35,983 postmenopausal women from a randomised trial comparing vitamin D 400 IU/day plus calcium 1000 mg/day with placebo. There were 363 and 381 adjudicated incident cases of HF over median follow-up of 7.1 years in the active treatment and placebo groups, respectively, with no between-group difference in risk in the overall population (HR 0.95 [p=0.46]). However, calcium/vitamin D supplementation had differential effects in HF risk subgroups (p=0.005 for interaction), with the risk being reduced in those with low HF risk (n=18,534; HR 0.63 [95% CI 0.46–0.87]) and unchanged in those with high HF risk with pre-existing HF precursors, including coronary heart diseases, diabetes mellitus or hypertension (n=17,449; 1.06 [p=0.51]).

Comment: Multiple observational studies have reported an association between low levels of 25-hydroxyvitamin D and HF (as well as several other CV diseases); however, the role of vitamin D in the pathogenesis of HF if any is unclear. In this post hoc analysis of the large Women’s Health Initiative of calcium plus vitamin D supplementation, the investigators reported a significant reduction (by approximately one third) in incident HF in women who had previously been recognised risk factors for future HF, but no benefit in women with pre-existing CV disease. More than 18,000 women were included in the low-risk group. The results suggest that this low-cost therapy may be an effective primary prevention strategy for HF in postmenopausal women without pre-existing CV disease; however, further research is required.

Reference: Circ Heart Fail 2015;8(1):49–56

Abstract

Exercise training as therapy for heart failure: current status and future directions

Authors: Fleg JL et al.

Summary: This paper reported the results of the NHLBI Working Group, focussing on questions that were raised by the group when they were asked to identify knowledge gaps in exercise training for patients with HF and suggest approaches to fill such gaps. The eight questions raised relate to: i) the meta-analysis of exercise intolerance in HF; ii) peripheral mechanisms of exercise intolerance in HF; iii) tailoring exercise training for elderly patients; women and those who are frail or have comorbidities; iv) starting rehabilitation earlier and in more severely decompensated patients; v) new training modalities and combinations; vi) improving long-term adherence and maintenance; vii) reducing the costs of training while increasing generalisability and dissemination; and viii) the most efficient, yet clinically meaningful, outcomes for trials. The paper concludes with the six recommendations made by the Working Group.

Comment: There has been a long-standing and understandable enthusiasm for the promotion of exercise training in the treatment of HF; however, trials to date have yielded at best modest improvements. The largest trial to date to explore the efficacy of exercise training in HF was the NHLBI-funded HF-Action trial, which recruited over 2300 patients with HFREF. It is noteworthy that the median age of participants in HF-Action was only 59 years, indicative of a relatively young HF population with few comorbidities. Even with this select group, adherence to the prescribed exercise training protocol was only 40% at 3 months. This is an excellent review that provides an update on eight major gaps in the existing knowledge of exercise training in HF as identified by experts at an NHLBI-funded workshop in 2012. The gaps are large and there is still much research needed.


Abstract

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