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October 2023 at a glance: From prevention to diagnosis, prognosis and treatment of acute decompensation and comorbidities

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Prevention

Prevention of heart failure (HF) has a key role in our health care.[1,2] Multivariable prediction models are frequently used to estimate the risk of incident HF. A systematic Bayesian meta-analysis, including 36 studies and 59 models for the prediction of HF, showed their predictive accuracy. However, 77% of model results were at high risk of bias, certainty of evidence was low, and no model had a clinical impact assessment.[3]

Monzo *et al.*[4] investigated the association of aldosterone concentrations with left ventricular (LV) remodelling after acute myocardial infarction (MI) in patients successfully treated by primary percutaneous coronary angioplasty for a first acute ST-elevation MI. LV volumes were measured within 4 days after acute MI using cardiac magnetic resonance and transthoracic echocardiography, 6 months later and, in a subset of cases, 3–9 years later. Aldosterone concentrations were associated with LV remodelling at 6 months, even in patients with an initial LV ejection fraction (LVEF) >40%, but not in the long term follow-up.

Heart failure with preserved ejection fraction

Recent data are showing the prognostic significance of LV global longitudinal strain (GLS) for the prediction of HF events.[5,6] Brann *et al.*[7] assessed GLS in patients with HF and preserved ejection fraction (HFpEF). Among the 311 patients studied, 128 (41%) had normal GLS (>−15.8%) and 183 (59%) had reduced GLS (<−15.8%). After a median follow-up of 4.6 years, patients with reduced GLS had a greater rate of the primary composite endpoint of cardiovascular (CV) mortality or HF hospitalization (hazard ratio 1.74, 95% confidence interval 1.3–2.4) and were more likely to develop LV ejection fraction (LVEF) deterioration.

The diagnosis of HFpEF remains challenging.[2,8–10] The detection of a pulmonary capillary wedge pressure (PAWP) ≥25 mmHg during exercise is a diagnostic criterion of HFpEF.[2,11,12] The diagnostic value of other diagnostic procedures is unknown. Wernhart *et al.*[13] evaluated prospectively 19 patients with intermediate risk of HFpEF, according to the European Society of Cardiology (ESC) HFA-PEFF score, using four different diastolic stress test modalities in randomized order: leg raise, fluid challenge, handgrip, and bicycle ergometry. Bicycle ergometry was associated with the largest increase in PAWP, compared to other modalities, and therefore confirmed its higher diagnostic value.

Acute heart failure and congestion

Decongestion is the major goal of treatment for patients with acute HF decompensation.[2,14–16] CLOROTIC showed a greater decrease in body weight at 72 h and a greater diuretic response with the addition of hydrochlorothiazide (HCTZ), compared with placebo, on top of furosemide in patients hospitalized for acute HF.[17] A post-hoc analysis of this trial explored the influence of estimated glomerular filtration rate (eGFR) on primary and secondary endpoints. Patients with eGFR ≥60 ml/min/1.73 m^2 had greater weight loss compared to the others. No significant differences were observed with the addition of HCTZ in terms of diuretic response, mortality or rehospitalizations, or safety endpoints across different eGFR values at baseline.[18]

EMPULSE showed the safety and beneficial effects of empagliflozin in patients hospitalized for acute HF further supporting the indication for an early start of sodium–glucose cotransporter 2 inhibitors after an acute HF event.[19–21] However, the impact of a concomitant use of mineralocorticoid receptor antagonists (MRAs) remains uncertain. Among 530 patients randomized to empagliflozin from the EMPULSE trial, 276 (52%) were receiving MRAs at baseline. These patients were younger, had lower LVEF, better renal function, and higher Kansas City Cardiomyopathy Questionnaire scores. Initiation of empagliflozin was associated with clinical benefit and was well tolerated irrespective of background MRA use.[22]

Halavina *et al.*[23] assessed the prognostic value of fluid overload, quantified with bioimpedance spectroscopy (BIS), among 880 patients with severe aortic stenosis scheduled for transcatheter aortic valve implantation. Overall, 360 patients presented fluid

overload at BIS, of whom >50% without clinical overt congestion. An increase in overload by 1.0 L at BIS was associated with worse post-interventional outcomes. Furthermore, quantitative fluid overload assessment improved risk stratification compared to traditional risk variables.

Prognosis and treatment

Yogasundaram *et al.*[24] investigated the relationship between baseline electrocardiographic (ECG) measurements and outcomes in 4880 patients with high-risk HF from the VICTORIA trial. After multivariable adjustment, tachycardia, larger QRS duration and absence of LV hypertrophy were associated with a higher risk of CV death and all-cause death. Contiguous pathologic Q waves were associated with an increased risk of CV, all-cause death and sudden death in women but not in men.

Close follow-up following hospitalization for HF improves prognosis.[25–27] Quality indicators for transitional care after HF hospitalization are lacking, despite high rates of readmission and death. A scoping review, including 42 randomized controlled trials provided a list of quality indicators that could guide clinical efforts, serve as research endpoints in transitional care in HF and help in resource distribution.[28]

Advanced HF is burdened by a very poor prognosis and quality of life and may require palliative care.[29,30] Blum *et al.*[31] reviewed similarities and differences between the 2021 ESC guidelines and the 2022 American Heart Association/American College of Cardiology/Heart Failure Society of America (AHA/ACC/HFSA) guidelines for the management of palliative care and end-of-life. Both guidelines highlight the importance of a multidisciplinary approach, with an important focus on physiological aspects. The American guidelines only provide official recommendation on palliative care. The ESC guidelines suggest a frequent symptom assessment and management, while the AHA/ACC/HFSA guidelines focus more on caregivers, hospice care and bereavement support, also distinguishing between primary and secondary palliative care levels.

Comorbidities

Cancer is a common comorbidity in HF patients.[2,32,33] A total of 193 359 Danish patients with new-onset HF from 2000 to 2018 were stratified into three groups according to comorbid breast, gastrointestinal and lung cancer: no cancer, history of cancer and active cancer. Standardized 1-year all-cause mortality was overlapping between the no cancer and history of cancer groups, while it was significantly higher among patients with active cancer. Age increased 1-year all-cause mortality in all groups, except in patients affected by lung cancer.[34]

Post-COVID-19 vaccine myocarditis can result from adaptive humoral and cellular, cardiac-specific inflammation within days and weeks of vaccination.[35] Myocardial damage after COVID-19 mRNA booster vaccination was analysed in a cohort of 777 hospital employees. Overall, 40 participants had elevated high-sensitivity cardiac troponin T (hs-cTnT) concentration on day 3 and mRNA-1273 vaccine-associated myocardial injury was adjudicated in 22 participants, of whom 20 were women. Hs-cTnT elevation was mild and temporary. No patient had ECG changes, and none developed major adverse cardiac events within 30 days.[36]

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