Sex Differences in Indications and Outcomes of De Novo Implantable Cardioverter Defibrillators with and without Resynchronization Therapy: The Modifying Role of Type 2 Diabetes

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Background

Women more often receive implantable cardioverter defibrillators (ICDs) and cardiac resynchronization therapy-defibrillator (CRT-Ds) for non-ischemic indications than men, partly reflecting a cardioprotective effect against ischemic heart disease. This advantage may be attenuated by type 2 diabetes mellitus (T2DM), which has been shown to disproportionately worsen cardiovascular prognosis in women. This study aims to study whether T2DM modifies sex differences in indications and outcomes following ICD or CRT-D implantation.

Methods

This Swedish registry-based study included 18,975 patients with de novo ICD/CRT-D implantation 2010–2021. Data from six national registries were combined and analyzed for sex differences in subgroups with and without T2DM. Baseline characteristics and device indications were compared with chi-square tests; outcomes (major adverse cardiovascular events (MACE), all-cause mortality and first heart failure (HF) hospitalization) with Kaplan-Meier curves and Cox models. Sensitivity analyses were performed with Fine–Gray model to account for competing risks.

Results

Structural indications (e.g. dilated cardiomyopathy, sarcoidosis) predominated in women, while ischemic indications were more common in men. A significant interaction was identified between sex and T2DM for left ventricular dysfunction-related indications in ICD-recipients, i.e. ischemic cardiomyopathy (p=0.0004) and post-infarction (p=0.004). After multivariable adjustment (age, socioeconomic factors, ischemic heart disease and HF), no sex differences in prognosis were observed among ICD recipients, regardless of T2DM status. In contrast, men receiving CRT-D had worse outcomes than women, even in the T2DM subgroup (MACE: adjusted hazard ratio: 1.54 [95% confidence interval: 1.12–2.12]; all-cause mortality: 1.61 [1.27–2.04]; HF hospitalization: 1.31 [1.08-1.58]). No significant interaction between sex and T2DM was found for any prognostic outcomes.

Conclusions

While T2DM status did alter sex differences in left ventricular dysfunction–related indications among ICD recipients, it did not negate the survival benefit of CRT-D observed in women. These results support equitable use of CRT-D in women, irrespective of T2DM status.

DC-cardioversion – Effective long-term for persistent atrial fibrillation?

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Background

Elective DC cardioversion (DC) is effective in terminating ongoing atrial fibrillation (AF). Many patients with AF are treated with DC, with symptoms ranging from mild to severe. Several patients with mild symptoms are diagnosed in connection with routine visits at primary care centres and are considered for and treated with DC. The aim of this retrospective study was to evaluate the long-term efficacy of a rhythm-strategy on the restoration of sinus rhythm (SR).

Method

A total of 201 patients with AF referred for DC and/or anti-arrhythmic medication were originally included in the multicentre study AMADEUS, which aimed at evaluating the impact of an internet-based educational program. A subgroup was available for ECG analysis through the regional ECG database after the completion of that study.

Results

A total of 126 patients with persistent AF who had undergone DC were available for long-term follow-up. Age: mean 68 years, range 44–90 years; 49 % were ≥70 years. Forty-three patients (34 %) were women. Follow-up: mean 4.2 years, range 1–7 years. Rhythm at the last available ECG: SR: 76 (60%), AF: 50 (40%). The number of patients who had undergone catheter ablation were 31 (25%) further details regarding other interventions are not presented.

Conclusions

In this long-term follow-up after DC, as many as 60 % of the patients were still in SR after more than 4 years, indicating that even elderly and not severely symptomatic patients can benefit from active measures to maintain SR long term. Considering the EAST-AFNET 4 trial, which showed a reduced risk of cardiovascular mortality in patients subjected to an early rhythm control strategy, the present strategy to relatively liberally offer DC seems well merited.

Cardiac Magnetic Resonance for Accurate Final Diagnosis in Patients with Suspected Non-ST-Elevation Myocardial Infarction

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Background

Routine invasive coronary angiography (ICA) in patients with suspected non-ST-elevation myocardial infarction (NSTEMI) show normal coronary arteries in over 20% of the cases, and studies using cardiac magnetic resonance (CMR) prior to ICA have shown that patients with significant stenosis may not have myocardial infarction. We aimed to determine whether CMR as a first line of investigation can improve diagnostic accuracy and management in patients with suspected NSTEMI.

Method

Sixty-four consecutive patients with suspected NSTEMI referred for ICA at the Karolinska University Hospital underwent CMR prior to ICA. The CMR examination included cine imaging, T1- and T2 mapping, and LGE on a 1.5T Siemens Sola. Four experts interpreted the CMR examinations in random pairs and disagreements were adjudicated by all interpreters in consensus. Acute MI was defined as elevated T1 (>1100 ms) and T2 (>55 ms) with corresponding ischemic-pattern LGE. Non-ischemic acute findings were defined as elevated T1 and T2 with non-ischemic pattern LGE. Prior MI was defined as LGE in the absence of elevated T1 and T2. The clinical team was blinded to the CMR findings.

Results

Forty-seven patients were revascularized with PCI or CABG, of which 12 had acute MI, 3 had mycarditis, and 32 had no findings on CMR. One patient was unsuitable for PCI but had no acute MI on CMR. The remaining 16 patients had no stenoses, of which 2 had acute MI, 3 had myocarditis, 1 had Tako-Tsubo-cardiomyopathy, and 10 had no acute findings on CMR.

Conclusions

There is a discrepancy between revascularization decisions based on ICA findings and CMR evidence of acute MI in patients with suspected NSTEMI. Further studies are needed to understand if these results are explained by a low sensitivity of CMR in detecting smaller MI, for example by using intra-coronary imaging to demonstrate the presence of plaque rupture.

Temporal changes in regional function, edema and myocardial perfusion in Takotsubo syndrome

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Background: Takotsubo syndrome (TTS) is frequent among patients with suspected myocardial infarction with non-obstructive coronary arteries (MINOCA). Hyperemia in unaffected segments and reduced stress perfusion in affected segments have been reported in the acute phase, but the temporal changes in perfusion, edema, and systolic function remain unclear. Therefore, this study aimed to assess these relationships.

Methods: Patients with cardiovascular magnetic resonance confirmed TTS, following suspected MINOCA, were scanned at 1.5T within 4 days of hospital admission, and after 6 months. Quantitative native T1, native T2 and ECV mapping were used for tissue characterization. Quantitative perfusion imaging was performed during adenosine stress and then at rest. Image analysis was done using Segment (Medviso). Segments were defined as affected if baseline peak circumferential strain (PCS) was worse than –16.0%.

Results: In total, 15 patients (65±8 years, 100% women) at baseline were included, and 11 underwent a 6-months follow-up, Table 1. Table 2 presents the comparison of baseline affected versus unaffected segments. The affected segments had higher T2 (53 [49-62] vs 50 [47-55]ms; p=0.003). Although resting perfusion did not differ between affected and unaffected segments, stress perfusion was lower in the affected segments (2.13 [1.72-2.52] vs 2.33 [1.86-2.84]ml/min/g; p=0.025). Table 3, shows the temporal changes from baseline to follow-up where rest perfusion was reduced at baseline in the affected segments, compared to follow-up (0.85 [0.64-0.99] vs 0.86 [0.70-1.03]ml/min/g; p=0.012). Multivariable linear regression analysis on the baseline segments (adjusted R2=0.154, p<0.001) revealed that T2 (β=0.287, p=0.023) and stress perfusion (β=-0.183, p=0.018) were independently associated with worse PCS.

Conclusion: Resting perfusion did not differ between affected and unaffected segments during the acute phase, unlike previous results. Edema and stress perfusion were independently linked to systolic dysfunction. Both stress and rest perfusion improved over time in affected segments, highlighting the temporal trends of recovery in TTS.

Prognostic Value of Serial Echocardiography and Cardiovascular Magnetic Resonance Including Myocardial Fibrosis Assessment in Asymptomatic Severe Primary Mitral Regurgitation

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Background

Risk stratification and timely intervention remain challenging in asymptomatic patients with primary mitral regurgitation (PMR). Conventional echocardiographic thresholds may inadequately capture early left ventricular (LV) remodelling, while the incremental prognostic value of serial multimodality imaging and myocardial fibrosis remains uncertain.

Methods

In this prospective single-centre observational study, 49 asymptomatic patients with severe PMR (mean age 62 ± 10 years, 92% male) underwent comprehensive transthoracic echocardiography (TTE) and same-day cardiovascular magnetic resonance (CMR) imaging at baseline, with repeat imaging after one year. Patients were followed for outcomes, with valve surgery as the primary endpoint. Baseline imaging parameters and one-year changes (Δ) were assessed for prognostic value. In a subset of operated patients, intraoperative biopsies were obtained for myocardial fibrosis quantification.

Results

During a median follow-up of 4.4 (2.1–8.5) years, 33 patients underwent mitral valve surgery. Patients who later required surgery already showed more advanced LV remodelling at baseline by both TTE and CMR (Table). In univariable analysis, baseline volumetric and regurgitation severity-related parameters predicted surgery, including LV end-diastolic volume index (LVEDVi), LV end-systolic diameter, effective regurgitant orifice area and regurgitant volume by echocardiography, as well as LVEDVi, LV stroke volume, and regurgitant volume and regurgitant fraction by CMR (Table). In contrast, LVEF, GLS, CMR-derived extracellular volume, and one-year changes in imaging parameters were not predictive. TTE correlated strongly with CMR for LVEDVi, despite systematic underestimation. Kaplan–Meier analysis demonstrated reduced surgery-free survival in patients with baseline echocardiographic LVEDVi ≥88 mL/m² (Figure). Histological analysis revealed normal or mildly increased myocardial fibrosis, with no correlation with CMR-derived extracellular volume.

Conclusions

In asymptomatic severe primary mitral regurgitation, baseline volumetric imaging markers, obtained by TTE or CMR, appear to improve risk stratification, whereas short-term longitudinal imaging and CMR-derived extracellular volume assessment add limited incremental value.

Unmasking Inflammatory Cardiomyopathy: A Prospective Cohort Comparison of Myocarditis, Cardiac Sarcoidosis, and Unconfirmed Cases

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BACKGROUND

Inflammatory cardiomyopathies are diagnostically and clinically elusive, with presentations ranging from subtle to severe. Differentiating prognosis among patients with confirmed myocarditis or cardiac sarcoidosis versus those who undergo evaluation but receive no definitive diagnosis remains a clinical challenge.

The aim of this study was to explore whether patients with suspected inflammatory cardiomyopathy, specifically those with myocarditis, cardiac sarcoidosis, or no confirmed diagnosis, differ in clinical profile and long-term outcomes.

METHODS

In this prospective cohort study, adults referred for suspected cardiomyopathy were enrolled in the Sahlgrenska CardioMyoPathy centre database between 2018 and 2025. Patients with myocarditis, sarcoidosis, or non-confirmed disease were included (n=218). Diagnoses were based on ESC guidelines. The primary outcome was a composite of all-cause mortality, mechanical circulatory support, or heart transplantation. Outcomes were analyzed using Kaplan–Meier estimates and Cox regression adjusted for age and sex.

RESULTS

Patients diagnosed with myocarditis were notably younger, while all groups showed a male predominance. At 12 months, the incidence of adverse cardiac events remained low across the board (2.5% in myocarditis, 10.7% in sarcoidosis, and 7.5% in unconfirmed cases). Over a median follow-up of 3.8 years, cardiac sarcoidosis patients experienced the highest event rate (15.5%), followed by unconfirmed cases (11.3%) and myocarditis (3.7%). Overall mortality was 6.9%, with low rates of mechanical support (0.9%) and transplantation (4.1%). While crude analysis showed variation in event-free survival (log-rank p = 0.039), adjusted models for age and sex revealed no statistically significant prognostic differences between the diagnostic group

CONCLUSIONS

Adverse events were infrequent in patients evaluated for suspected inflammatory cardiomyopathy. Long-term prognosis appeared to be driven more by demographic factors than by diagnostic classification, highlighting the need for individualized risk assessment beyond diagnostic labels.

Elevated levels of matrix metalloproteinase-12 independently predict development of abdominal aortic aneurysm during 23 years of follow-up

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Background

Prediction of abdominal aortic aneurysm (AAA) and aortic dissection (AD) based on traditional risk factors remains limited. We therefore evaluated whether plasma protein biomarkers and family history improve long term prediction of AAA and AD.

Methods

We followed 5,550 participants from the Malmö Diet and Cancer Study cardiovascular cohort (1991–1994) for incident AAA and AD through 2019. Baseline plasma proteins were measured using the Proseek Multiplex CVD I and Oncology I panels (Olink Biosciences). Diagnoses of AAA and AD in participants and first degree relatives were obtained through linkage with the Swedish Multi generation Register and National Patient Register. Associations between biomarkers, family history, and disease development were analyzed with adjustment for conventional risk factors and correction for multiple comparisons.

Results

During a median follow up of 23.4 years, 86 participants developed AAA. Compared with those without AAA (n=5,085), affected individuals were older (p=0.007), more often male (p<0.0001), and had higher baseline systolic (p=0.001) and diastolic (p=0.002) blood pressure, total (p=0.022) and LDL cholesterol (p=0.006) , triglycerides (p<0.001), and hemoglobin (p<0.001), as well as lower HDL cholesterol (p<0.001). They were also more likely to have a sibling with AAA (p=0.005). Twenty six plasma proteins differed between groups in unadjusted analyses; however, after adjustment for age, sex, BMI, systolic blood pressure, LDL cholesterol, diabetes, and multiple testing, only matrix metalloproteinase (MMP) 12 remained significantly associated with future AAA (median 7.13 [6.66–7.69] pg/mL vs. 6.52 [6.08–7.00] pg/mL; p=0.0009). In contrast, no baseline clinical variables, family history, or protein biomarkers were associated with incident AD (n=20).

Conclusions

Elevated baseline levels of MMP 12 independently predict development of AAA over more than two decades of follow up, supporting a potential role for MMP 12 in early risk stratification and AAA pathogenesis.

Patients perspectives on physical activity and cardiac rehabilitation after spontaneous coronary artery dissection. A qualitative study.

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Background: Spontaneous coronary artery dissection (SCAD) is a rare cause of acute coronary syndrome, predominantly affecting women in young to middle age. Physical activity has been identified as a potential trigger for SCAD, and this possible association may influence the clinical advice provided to patients, the likelihood of referral to cardiac rehabilitation, and patients' own attitudes toward physical activity and rehabilitation participation.

Purpose: To explore SCAD patients perceptions of physical activity after SCAD and the cardiac rehabilitation resources available to them following their event.

Methods: Twenty-nine individuals (median age 57) who had experienced a SCAD event within the past three years participated in this qualitative study. Data were collected via semi-structured focus group interviews conducted online (Zoom) and analysed using qualitative content analysis.

Result: In total, 12 subcategories and five overarching categories emerged: Re-negotiating bodily capacity, Navigating an unclear informational landscape, Seeking support within a complex healthcare context, Creating meaning through connection and recognition, and Regaining control over every day physical activity. Together, these categories illuminate how physical activity after SCAD is not merely a behavioural adjustment, but a deeply embodied and socially embedded process of recovery, negotiation, and meaning making.

Conclusion: This study contributes to a growing body of knowledge on SCAD by illuminating how survivors navigate physical recovery in the absence of tailored support. The findings suggest that rehabilitation should not only address physical capacity but also emotional safety, individual context, and social connection. A more coherent and person-centred approach to SCAD care may enhance recovery outcomes and reduce the burden of uncertainty that many patients face.

Improved risk prediction using machine learning on perfusion CMR and 10-year registry data

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Background

Accurate risk prediction for coronary heart disease is essential to guide therapy and follow□up. Perfusion Cardiac Magnetic Resonance (CMR) carry prognostic information, but the value of combining CMR with longitudinal comorbidity data using machine learning is underexplored. We aimed to quantify the incremental value when adding 10 years of registry□derived diagnoses and procedures to CMR metrics for predicting 5-year major adverse cardiovascular events (MACE: cardiovascular death, myocardial infarction, unstable angina, or coronary intervention) in patients with chest pain.

Methods

We identified 2239 referrals for perfusion CMR; 80 with missing data were excluded, leaving 2159 for analysis. Examinations were performed on a 1.5T scanner using a single□bolus, dual□sequence technique. Predictors included demographics (age, sex, BMI), 10□year cardiac health registry data, and CMR variables (LVEF, indexed LVEDV/LVESV/LV mass, infarct, ischemia). Random Forest models were used for predicting MACE, discrimination was assessed using ROC AUC, and differences were tested with the DeLong's test.

Results

The cohort had a mean age of 65.4 ± 12.2 years; 44% were women; mean BMI was 27.6 ± 5.1 kg/m². During 2.5 ± 1.0 years of follow□up, MACE occurred in 9.1%. A model using only registry and demographic data achieved an AUC of 0.735 (Figure 1). Adding CMR metrics significantly improved AUC to 0.818 ($\Delta = 0.083$; $p < 0.0001$). The combined model also outperformed a model using CMR plus demographics alone (AUC 0.786; $\Delta = 0.032$; $p < 0.0001$). Permutation importance identified stress□induced ischemia as the dominant predictor (Figure 2).

Conclusion

In chest pain patients, perfusion CMR conferred substantial prognostic information, but integrating 10□year registry comorbidity data via machine learning further improved risk prediction beyond either data source alone. These findings highlight the importance of both cardiac risk factors and ML assistance for accurate risk assessment.

Comparison of secondary prevention adherence and goal accomplishment for patients with myocardial infarction treated with coronary artery bypass grafting versus percutaneous coronary intervention: a nationwide SWEDEHEART study

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Background

The risk for long-term cardiovascular events after coronary artery bypass grafting (CABG) remains high, and secondary preventive treatment is often inadequate. We evaluated adherence and goal accomplishment to guideline-directed medical therapy (GDMT) and lifestyle recommendations in a large nationwide cohort of patients with myocardial infarction (MI), comparing those treated with CABG and percutaneous coronary intervention (PCI).

Methods

All patients that underwent CABG (n=4888) or PCI (n=60246) from 2013 to 2022 after an MI and were registered in SWEDEHEART were included. Adherence to GDMT, lifestyle recommendations, and goal accomplishments according to European guidelines were assessed and compared between CABG and PCI patients using chi-square tests.

Results

Overall use of GDMT remained high and stable during the study period in both groups, except for a decline in betablocker use which was more prominent in the PCI group, Fig 1. In 2022, 99.7% and 99.0% (p=0.12) of CABG and PCI patients were treated with antithrombotics, 97.5% and 97.1% (p=0.70) with lipid-lowering drugs, 73.1% and 78.6% (p=0.003) with RAAS-inhibitors and 84.8% and 70.6% (p<0.001) with betablockers, respectively. Achievements of blood pressure and LDL-cholesterol targets increased over time and was in 2022 achieved in 65.0% and 62.2%, (p=0.22), and 58.6% and 63.8% (p=0.014), respectively. Physical activity levels remained unchanged, with 42.9% and 41.6% (p=0.61) reporting moderate physical activity at least five times per week in 2022. CABG patients more frequently attended exercise-based cardiac rehabilitation (EBCR) (43.2 vs 38.6%, p=0.031) and showed a non-significant difference in achieved smoking cessation (67.0 vs 58.8%, p=0.13), Fig 2.

Conclusions

Use of secondary prevention medications after MI is high in both CABG and PCI patients in Sweden. However, more than one-third still fail to accomplish guideline-recommended targets for LDL-cholesterol, blood pressure, physical activity, and smoking cessation, and less than half participated in EBCR, indicating substantial room for improvement.

Preoperative frailty and risk of unplanned readmission and mortality within the first year after transcatheter aortic valve implantation.

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Frailty is associated with increased mortality following transcatheter aortic valve implantation (TAVI). It is not clear how the level of preoperative frailty influences the risk of unplanned readmission. Therefore, we examined the proportions of unplanned readmission the first year after TAVI, in relation to preoperative frailty level.

METHODS

All patients, aged >65 years, who were treated with TAVI at Sahlgrenska University Hospital from November 2019 to December 2023 were included in the study. To estimate preoperative frailty, we used Clinical Frailty Scale (CFS), divided in three frailty groups. To compare the proportions of mortality and unplanned readmission, Ch2 and Fischer's exact test were used.

RESULTS

In total, 460 TAVI patients were included (mean age 81.8 years, SD 5.4), 50.7% women. Preoperatively, 19% of the patients were assessed as not frail (CFS 2-3), 58% with very mild frailty (CFS 4) and 23% with mild to moderate frailty (CFS 5-6). Within the first year after TAVI, 5.9% of the patients died, 7.0% in CFS group 2-3, 3.0% in frailty group CFS 4 and 12.3% in frailty group CFS 5-6 (p= 0.03). Overall, 32.0% of the patients had unplanned hospitalization by any reason the first year after TAVI, 25.6% in CFS 2-3, 30.2% in CFS 4 and 41.5% in CFS 5-6 (p=0.04). Readmission occurred in 13.7% for cardiovascular, 2.3% for neurological, and 17.0% for other reasons. In total, 9.9% of the patients had >1 unplanned hospitalizations, 7.1% in CFS 2-3, 8.6% in CFS 4 and 14.4%in CFS 5-6 (p=0.12).

CONCLUSIONS

Patients with mild to moderate frailty had a significantly higher risk of both mortality and unplanned hospitalization the first year following TAVI than patients with no or very mild frailty. These results emphasize the importance of evaluate level of frailty preoperatively, in order to facilitate a careful patient selection to TAVI.

Exploring the relationship between self-reported kinesiophobia, physical activity and symptoms of anxiety and depression at 7 Months post out-of-hospital cardiac arrest.

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Background: One-third of out-of-hospital cardiac arrest (OHCA) survivors report low levels of physical activity. Fear of movement (kinesiophobia) may be a contributing factor to low level of physical activity but remains insufficiently explored in this population.

Aim: To investigate the prevalence of self-reported kinesiophobia seven months after OHCA and its relationship with self-reported and objectively assessed physical activity. Additionally to explore the relationship between self-reported kinesiophobia and symptoms of anxiety and depression.

Method: Cross-sectional sub-study conducted within the Targeted Hypothermia versus Targeted Normothermia after Out-of-Hospital Cardiac Arrest (TTM2) trial at eight sites in Sweden, Denmark, and the United Kingdom. Kinesiophobia was assessed by the Tampa Scale of Kinesiophobia–Swedish Version Heart (TSK-SV Heart) with the cut-off ≥37 points indicating kinesiophobia. Moderate to vigorous physical activity (MVPA) was assessed by self-reported frequency, intensity, time and type of activity in training diaries, and objectively by accelerometers for one week. Spearman correlations were performed to explore the relationship between kinesiophobia, self-reported and objectively assessed physical activity and symptoms of anxiety and depression.

Results: 101 of 108 (94%) eligible OHCA survivors completed TSK-SV Heart (Figure 1), with a mean age of 61 (±11) years and 88% were males. The mean TSK-SV Heart score was 30 (±7), and 18 participants (18%) reported kinesiophobia. Self-reported MVPA was in median 160 [0:415] minutes/week and objectively assessed 209 [92:332] minutes/week. The median HADS-Anxiety and HADS-Depression scores were 3 [1:6] and 2 [1:4] respectively (Table 1). Kinesiophobia showed no relationship with either self-reported or objectively assessed MVPA (rs=0.04, p=0.66 and -0.19 p=0.07, Table 2). Kinesiophobia showed weak significant correlations with anxiety and depression symptoms (rs=0.37 and 0.34, both p<0.01, Table 2).

Conclusion: Kinesiophobia showed no relationship with self-reported and objectively assessed physical activity. Addressing kinesiophobia in relation to symptoms of anxiety and depression may be considered in post-OHCA rehabilitation.

Preparedness for caregiving among informal caregivers of people with heart failure: insights into challenges and areas for improvement

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Background: The aim of this study was to determine informal caregivers' preparedness for caregiving in the context of heart failure (HF) and to identify factors associated with preparedness.

Methods: Data included demographic variables and the Preparedness for Caregiving Scale (PCS), Rewards of Caregiving Scale, Caregiver Competence Scale, Multidimensional Scale of Perceived Social Support, Control Attitude Scale, Hospital Anxiety and Depression Scale, European Heart Failure Self-Care Behaviour Scale – Caregiver Version, Heart Failure Caregiver Questionnaire and EuroQol.

Results: A total of 202 informal caregivers (89% women, mean age 64 years) were included. Daily caregiving was reported by 37% and 76% were partners to the person with HF. According to the PCS, 6 % of caregivers felt generally very well-prepared, 30 % well-prepared, 40 % somewhat prepared, 18 % poorly prepared and 4 % not prepared at all. Caregivers perceived preparedness varied across specific caregiving tasks. They felt least prepared for managing stress (7 % not prepared at all), handling acute situations (5 % not prepared at all), and addressing their partner's physical needs (5 % not prepared at all).

A logistic regression analysis identified factors significantly associated with preparedness. Higher rewards of caregiving and a greater perceived control over the heart disease were associated with increased preparedness for caregiving. Other factors, such as gender, age, education, current health status, perceived social support, self-care abilities, and depressive symptoms, were not significantly associated with preparedness for caregiving.

Conclusions: Many informal caregivers of people with HF feel partially or well-prepared for caregiving, but specific areas remain challenging. This study underscores the importance of providing targeted support to address these gaps. Factors such as reward and perceived control were found to positively influence preparedness, highlighting the value of focusing on these factors when developing support for caregivers.

SUSTAINABLE HYPERTENSION MANAGEMENT IN PRIMARY CARE – RESULTS FROM A PILOT STUDY

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Background

Hypertension represents a major challenge in Swedish primary care, with increasing patient numbers, limited resources, and poor blood pressure (BP) control. Sustainable, patient-centred, and team-based models are needed to improve health outcomes and resource efficiency. The SHIP-CARE (Sustainable Hypertension Management in Primary Health Care) project evaluates new models for hypertension management in Swedish primary care.

Methods

To explore the feasibility of the intervention, a pilot study was conducted at two primary health care centres (PHCCs) in southern Sweden. Adults with hypertension were followed for six months. The intervention included targeted education and a structured treatment protocol for professionals. Patients received group-based education, a home BP monitor, and maintained digital contact with a nurse for medication adjustments and follow-up. The nurse consulted physicians as needed. Annual physician visits were reserved for patients at high cardiovascular (CV) risk or with complications.

The main outcome of the pilot study was feasibility. Secondary outcomes included changes in BP, CV risk factors, patient and staff satisfaction, and health care costs. Data were collected at baseline and after six months. Additionally, separate focus group interviews were held with patients and professionals involved.

Results

In total, 106 patients (mean age 68; 48% women) were followed for six months and 57% classified as high CV risk. Among the 99 patients who until now have completed the intervention, mean office BP declined from 137/83 to 129/78 mmHg ($p < 0.001$), and the proportion achieving BP <140/90 mmHg increased from 54% to 73% ($p = 0.003$).

Conclusions

The intervention appears to lower BP and improve target attainment, suggesting potential benefits for CV risk management. Results will influence the design of a larger cluster-randomised, controlled trial comparing PHCCs implementing SHIP-CARE with those using standard care. If successful, SHIP-CARE could improve BP control, working conditions, and cost-effectiveness in primary care.

Biventricular Hemodynamic Phenotyping of Transthyretin Amyloid Cardiomyopathy vs. HFpEF: A Pilot Invasive Pressure-Volume Loop Analysis

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Background: Transthyretin amyloid cardiomyopathy (ATTR-CM) is frequently misclassified as heart failure with preserved ejection fraction (HFpEF) owing to overlapping clinical and echocardiographic features. Although both conditions are characterized by restrictive ventricular physiology, conventional non-invasive imaging primarily reflects volumetric function and often fails to capture the underlying biventricular energetic and contractile abnormalities. We aimed to characterize the comprehensive biventricular hemodynamic signature of transthyretin cardiac amyloidosis (ATTR-CM) using gold-standard invasive pressure–volume (PV) loop analysis with simultaneous left- and right-ventricular assessment.

Methods: Patients with confirmed ATTR-CM (n=2) and HFpEF (n=2) underwent invasive biventricular PV loop catheterization. Key hemodynamic indices, including end-systolic (ESPVR) and end-diastolic pressure-volume relationships (EDPVR), ventricular-arterial (V-A) coupling, and myocardial energetic efficiency (MEE) were calculated during steady state conditions. Load-independent indices were derived using inferior vena cava (IVC) occlusion.

Results: Despite comparable heart rates and stroke volumes, ATTR-CM was characterized by lower biventricular contractility, with a 66% lower LV ESPVR in ATTR-CM (1.6 vs. 4.5mmHg/mL) and 68% lower RV ESPVR (0.5 vs.1.4 mmHg/mL) compared to HFpEF. This difference in RV contractility was confirmed with a lower RV ESPVR slope (RV Ees) in ATTR-CM with preload reduction via Inferior Vena Cava occlusion (0.3 vs 0.8 mmHg/mL). ATTR-CM displayed 83% larger LV end-systolic volumes, lower LV & RV energetic efficiency (LV MEE: 58% vs. 72%, RV MEE 69% vs. 80%), and 85% higher ventricular-arterial mismatch (1.16 vs. 0.63). Interestingly, ATTR-CM exhibited 49% lower LV stiffness (LV EDPVR: 0.12 vs 0.23mmHg/mL).

Conclusions: Preliminary PV analysis suggests that ATTR-CM is hemodynamically distinct from HFpEF with impaired biventricular systolic reserve, ventricular-arterial mismatch and mechanical inefficiency. LV and RV contractility, assessed using

pressure–volume–derived indices, represent a key mechanistic finding with direct clinical relevance. Comprehensive hemodynamic phenotyping may support precision therapy in ATTR-CM.

Muscular endurance in the musculus triceps surae in adults with congenital heart disease: A longitudinal registry study

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Background: Previous research has shown that adults with congenital heart disease (ACHD) have reduced muscular endurance in the lower extremities; however, studies regarding changes in endurance over time are lacking. The aim was to longitudinally study muscular endurance in m. triceps surae using heel-rise test in patients with ACHD, and to assess potential differences according to sex, age and diagnosis severity.

Methods: This study was based on registry data from the physiotherapy department at Sahlgrenska University Hospital/Östra between April 2009 to February 2025. In total, 380 patients ≥ 18 years with ACHD, who had completed unilateral heel-rise test with the same leg on at least two occasions with ≥1 year between tests, were included.

Results: The median age was 30 [IQR: 23, 43] years, and 172 (45.3%) patients were women. The mean time in years between the two included test occasions was 6.3 (3.8 SD) and was categorized into 4-year intervals (1–4; 5–8; 9–12; and 13–16 years). No significant differences were observed over time in muscular endurance of the m. triceps surae. Furthermore, no significant differences were found with respect to sex ($p = 0.730$), age group ($p = 0.228$), diagnosis severity ($p = 0.489$), or time intervals ($p = 0.412$).

Conclusions: No statistically significant changes in muscular endurance of the m. triceps surae were observed over time. However, no studies have established the minimally clinically important difference for the heel-rise test in this population. As patients live longer with CHD, parameters studying lifestyle factors are becoming increasingly important. To the best of our knowledge this is the first study to report muscular fitness longitudinally in patients with ACHD. Further research is warranted to assess muscular endurance over time with longer time periods between tests, with larger populations and more tests of muscular fitness.

Remote Monitoring-Supported Care Reduces Time to Optimal Medical Therapy in Heart Failure After Myocardial Infarction

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Background

Early initiation of guideline-directed medical therapy improves outcomes in heart failure, but achievement of optimal medical therapy (OMT) is often delayed in routine care. Structured follow-up incorporating remote monitoring may enable earlier treatment optimization after discharge for new-onset heart failure following myocardial infarction (MI).

Aim

To compare time to achievement of OMT in patients with post-MI heart failure managed with remote-supported follow-up versus standard care.

Methods

This observational cohort study included 31 patients with post-infarction heart failure (left ventricular ejection fraction <40%): 15 managed within the SÖS Hemma remote-supported follow-up program implemented in April 2025 and 16 receiving standard care during the same period in 2024. Patients were followed until achievement of OMT—defined as the highest tolerated dose of four guideline-recommended drug classes (ACE inhibitor/ARB/ARNI, beta-blocker, mineralocorticoid receptor antagonist, and SGLT2 inhibitor)—or for 365 days. The primary outcome was time from discharge to achieved OMT, compared using the log-rank test and illustrated with Kaplan–Meier curves. Secondary outcomes included time to first titration and 30-day clinical events.

Results

Patients in the SÖS Hemma group were slightly younger (median age 64 vs. 71 years) and included a higher proportion of men; left ventricular ejection fraction and STEMI proportion were similar between groups. All patients in the intervention group achieved OMT, compared with 75% in the standard care group. Median time to OMT was significantly shorter with remote-supported follow-up (42 vs. 156 days; log-rank $p < 0.001$), as was time to first titration (7 vs. 34 days; $p < 0.001$). Rates of 30-day readmission and adverse events were low and similar between groups.

Conclusions

Remote-supported follow-up after MI was associated with substantially faster achievement of OMT without compromising short-term safety. These findings support implementing structured, remote-supported care models to improve timely delivery of guideline-directed therapy in post-infarction heart failure.