Effect of implantable cardioverter-defibrillator in non-ischaemic systolic heart failure according to the Heart Failure Collaboratory Medical Therapy Score: extended follow-up of the DANISH trial

A. Yafasova1, S. Doi1, J.J. Thune2, J.C. Nielsen3, J. Haarbo4, N.E. Bruun5, F. Gustafsson6, H. Eiskjaer3, C. Hassager1, J.H. Svendsen1, D.E. Hoefsten1, C. Torp-Pedersen5, S. Pehrson1, L. Koeber1, J.H. Butt1

1Rigshospitalet - Copenhagen University Hospital, Copenhagen, Denmark
2Bispebjerg University Hospital, Copenhagen, Denmark
3Aarhus University Hospital, Aarhus, Denmark
4Herlev Hospital, Herlev, Denmark
5Zealand University Hospital, Roskilde, Denmark
6Nordsjaellands Hospital, Hilleroed, Denmark

On behalf of Investigators of the DANISH trial

Funding Acknowledgements: Type of funding sources: Foundation. Main funding source(s): - The DANISH trial was supported by unrestricted grants from Medtronic, St Jude Medical, Tryg Fonden, and the Danish Heart Foundation.
- Dr. Yafasova was funded by the Fund of Rigshospitalet.

Background: The Heart Failure Collaboratory (HFC) has developed a medical therapy score which integrates types and doses of guideline-directed pharmacotherapies in patients with systolic heart failure, providing a measure of treatment quality. In clinical trials, this score may help determine the additive effect of new treatments. In the Danish Study to Assess the Efficacy of Implantable Cardioverter Defibrillators (ICDs) in Patients with Non-ischaemic Systolic Heart Failure on Mortality (DANISH) trial, ICD implantation did not provide an overall survival benefit in patients with non-ischaemic systolic heart failure.

Purpose: Adding four years of additional follow-up to the DANISH trial, we examined the effect of ICD implantation according to baseline modified HFC (mHFC) medical therapy score.

Methods: In the DANISH trial, 1,116 patients with non-ischaemic systolic heart failure were randomised to receive an ICD (N = 556) or usual clinical care (N = 560, control group). The primary outcome was death from any cause. In the mHFC score, patients were assigned a score for each drug class of the original cornerstones of systolic heart failure treatment (renin-angiotensin-system inhibitor, beta-blocker, and mineralocorticoid receptor antagonist). The maximum score was 100%, corresponding to optimal medical therapy with all three types of medication (=>50% of target dose).

Results: The median mHFC score at baseline was 67% (25th-75th percentile, 67%-100%; range, 17%-100%). During a median follow-up of 9.5 years, the ICD group did not have significantly lower all-cause mortality compared with the control group (hazard ratio [HR] 0.89 [95% CI, 0.74-1.08]). The results were independent of the mHFC score at baseline (mHFC score < median: HR 0.91 [95% CI, 0.70-1.19]; mHFC score > median: HR 0.87 [95% CI, 0.66-1.14]; P for interaction, 0.94). Similarly, ICD implantation did not reduce the rate of cardiovascular death overall (HR 0.87 [95% CI, 0.70-1.09]), and this association was not modified by the mHFC score (mHFC score < median: HR 0.90 [95% CI, 0.65-1.24]; mHFC score > median: HR 0.84 [95% CI, 0.61-1.15]; P for interaction, 0.89). The ICD group had a significantly lower rate of sudden cardiovascular death in the overall population (HR, 0.60 [95% CI, 0.40-0.92]), and this association was not modified by the mHFC score (mHFC score < median: HR 0.72 [95% CI, 0.40-1.29]; mHFC score > median: HR 0.53 [95% CI, 0.28-0.99]; P for interaction, 0.59). See Figure for results.

Conclusions: In this extended follow-up study of the DANISH trial, ICD implantation did not provide an overall survival benefit in patients with non-ischaemic systolic heart failure regardless of baseline medical heart failure therapy, assessed by the mHFC score.
Modified HFC score in the DANISH trial