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Meeting abstract

1002 Women with severe ischemic cardiomyopathy have worse survival than men despite similar degree of myocardial scar: a delayed hyper-enhancement MRI study

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Background

Patients with severe ischemic cardiomyopathy (ICM) have reduced survival. The association between degree of scarring, gender and survival is unclear in such patients. We sought to determine, using delayed hyperenhancement magnetic resonance imaging (DHE-MRI), if female gender is associated with increased mortality in ICM patients with severe left ventricular (LV) dysfunction.

Methods

349 patients (24% women) with severe ICM >/= 70% stenosis in >/= 1 epicardial vessel on angiography and mean LV ejection fraction (EF) 23%], that underwent DHE-MRI (Siemens 1.5 T scanner, Erlangen, Germany) from 2003–6 were studied. DHE-MR images were obtained in standard long and short axis orientations (covering the entire LV), after injection of Gadolinium dimenglumine using an inversion recovery spoiled gradient echo sequence: TE 4 msec, TR 8 msec, flip angle 300, bandwidth 140 Hz/pixel, 23 k-space lines acquired every other RR-interval, field of view (varied from 228–330 in the x-direction and 260–330 in the y-direction) and matrix size (varied from 140–180 in the x-direction and 256 in the y-direction). For DHE-MRI analysis, a custom analysis package (VPT software, Siemens, Erlangen, Germany) was used to manually delineate endocardial and epicardial myocardial edges. Scar was defined (as % of myocardium in a 17-segment model on custom software, Siemens Research) on DHE-MR images, as intensity > 2 standard deviation above viable myocardium. Transmurality score was recorded in all segments as follows: 0 = no scar, 1 = 1–25% scar, 2 = 26–50%, 3 = 51–75% and 4 = > 75%. Global LV scar burden was calculated as transmurality score for all segments/17. LV volumes, EF, demographic/clinical data, history of cardiac transplantation and all-cause mortality were recorded.

Results

There were 56 events (51 deaths and 5 cardiac transplantations) over a mean follow up 2.6 ± 1.2 years. Characteristics of men vs. women are shown in Table. On univariate survival analysis, women had worse outcomes, compared to men (log-rank p = 0.03 Figure 1), despite similar extent of scar (Table 1).

Conclusion

In ICM patients with severely reduced LVEF, women have worse outcomes, compared to men, despite similar risk factors, LVEF, myocardial scar burden and smaller volumes.

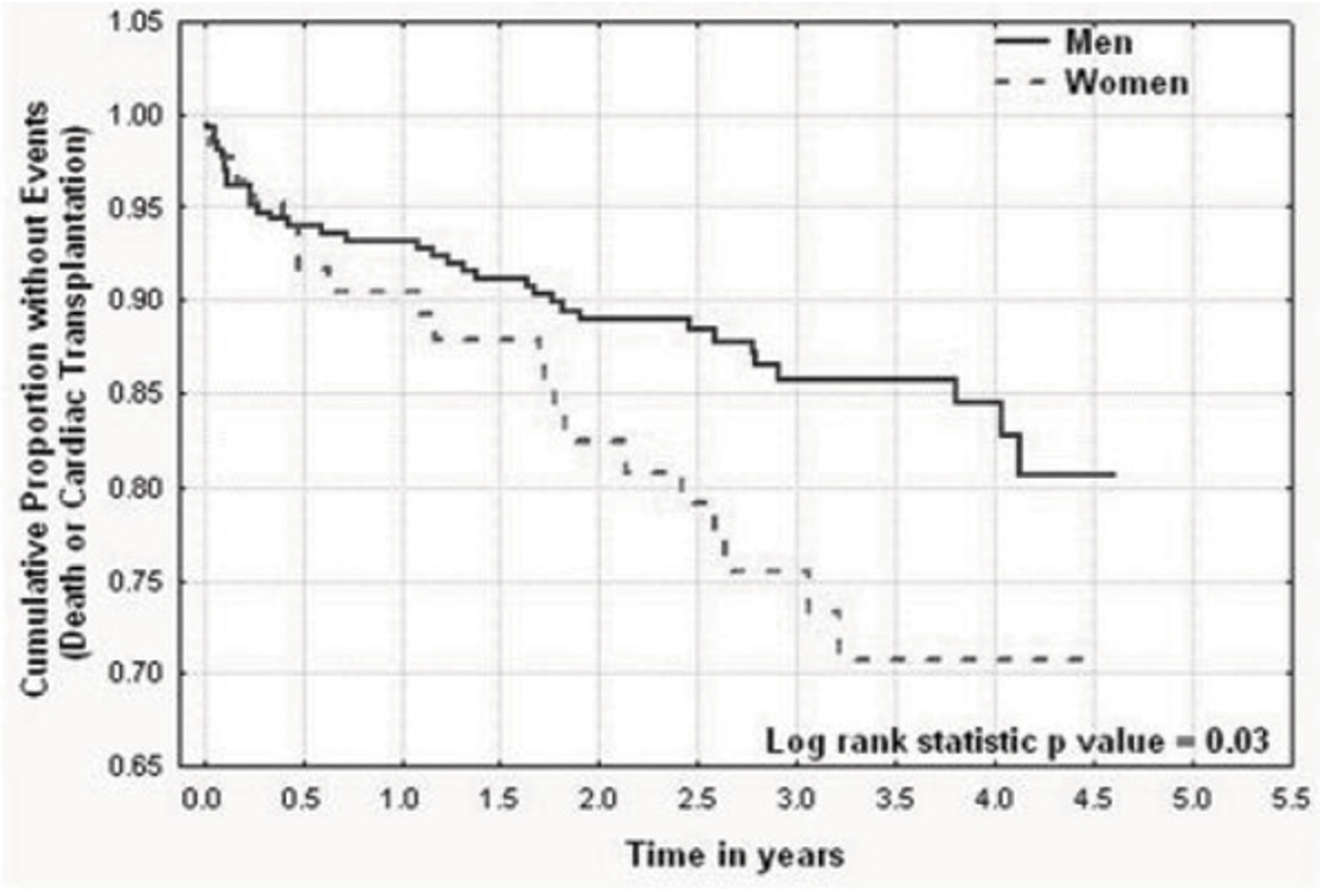
Men
Women
Cumulative Proportion without Events
(Death or Cardiac Transplantation)
1.05
1.00
0.95
0.90
0.85
0.80
0.75
0.70
0.65
Log rank statistic p value = 0.03
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
Time in years

Figure 1

Table 1: In ICM patients with severely reduced LVEF, women have worse outcomes, compared to men, despite similar risk factors, LVEF, myocardial scar burden and smaller volumes.

Total n = 349	Men (n = 265)	Women (n = 84)	p-value
Age (years)	66 ± 11	64 ± 12	0.20
Diabetes Mellitus (%)	75 (28)	24 (29)	0.9
Hypertension (%)	93 (35)	34 (40)	0.4
Betablockers (%)	150 (57)	51 (60)	0.6
Angiotensin converting enzyme inhibitors(%)	126 (48)	37 (44)	0.6
Statins (%)	142 (54)	47 (56)	0.70
History of coronary artery bypass grafting	22 (8)	7 (8)	0.9
LV ejection fraction (%)	23 ± 8	25 ± 8	0.23
LV enddiastolic volume (ml)	241 ± 107	189 ± 88	<0.001
LV endsystolic volume (ml)	142 ± 90	100 ± 68	0.001
Mean scar % on DHE-MRI	32 ± 21	29 ± 21	0.39
Number of segments with transmurality score ≥ 3 on DHE-MRI	8.2 ± 5	7.7 ± 5	0.36
Global LV scar burden on DHE-MRI	2.10 ± 1.1	2.00 ± 1.1	0.37
Post MRI revascularization (%)	72 (27)	17 (20)	0.20
Post-MRI ICD or CRT	70 (26)	25 (30)	0.55
Combined events (death or cardiac transplantation during follow-up) (%)*	31 (12%) death and 5 cardiac transplantations	20 (24)	0.03

DHE-MRI: delayed hyperenhancement magnetic resonance imaging, LV: left ventricle, ICD: implantable cardioverter defibrillator, CRT: cardiac resynchronization therapy