

Sex differences in implantable cardiac defibrillator decision: myth or fact?

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Introduction: Previous studies have found sex differences in implantable cardiac defibrillator (ICD) implantation counseling, especially in primary prevention. Possible explanations to this phenomenon have been described: under-representation of women in clinical trials, patient's preferences, lower overall sudden cardiac death risk in women compared to men, higher prevalence of non-ischemic dilated cardiomyopathy (DCM) in women and better response to cardiac resynchronization therapy in this population. Nevertheless, this gap appears to narrow in most recent registries.

Purpose: Our aim is to assess if there is still sex discrimination in ICD counseling by comparing ICD implantation between men and women.

Methods: A single-centre retrospective registry of 160 patients with a reduced left ventricle ejection fraction (LVEF $\leq 35\%$) found in a routine transthoracic echocardiogram (TTE) from January 2019 to June 2020. Inclusion and exclusion flow chart is described in Picture 1. Data collected included demographic, clinical and echocardiographic characteristics. Date of heart disease diagnosis, earliest date of LVEF $\leq 35\%$ diagnosis (with TTE or cardiac magnetic resonance) and date of death when applicable were recorded. Cardiac resynchronization devices with ICD function were also considered for the analysis. In ICD carriers, implantation date and type of prevention for indication were collected. ICD implants and deaths up to December 31, 2020 were included for the analysis.

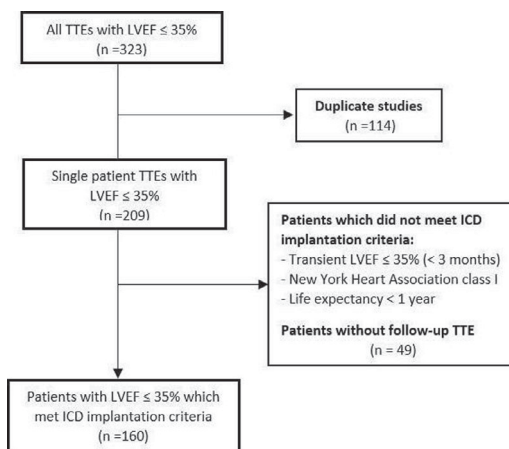
Results: Basal characteristics are described in Picture 2. The mean age was 67.5 years and 24.4% of the population were women. Ischemic etiology was the most frequent etiology in the overall population and in the male group. In women, DCM was the most common etiology.

Sixty-eight patients carried an ICD. No significant differences between both sexes, neither globally nor according to the implant indication (primary vs. secondary prevention) were observed.

In the subgroup analysis of patients with ICD, there were no significant differences in the number of devices between men and women, neither in ischemic or non-ischemic etiology. In primary prevention, there was a non-significant trend towards earlier implantation of the device in women (1.4 years vs 3.4 years, $p=0.008$) since the diagnosis of LVEF $\leq 35\%$.

In patients without ICD ($n=92$), the mean age was significantly higher (72.5 years vs. 60.8 years, $p<0.0001$) and similar in both sexes (women 74.6 years, men 71.8 years, $p=0.414$).

Conclusions: Despite under representation of women in our population, we could not find differences in ICD implantation decision based on gender, even considering differences in underlying cardiomyopathy. There was no delay in implantation depending on sex, and even the trend was towards earlier implantation in women.



Inclusion and exclusion flow chart

Variables	Total (n = 160)	Female (n = 39)	Male (n = 121)	p
Age (years)	67.5 ± 15.0	69.3 ± 14.3	66.9 ± 15.3	0.391
- Without ICD	72.5 ± 14.1	74.6 ± 13.7	71.8 ± 14.3	0.414
- With ICD	60.8 ± 13.6	61.8 ± 11.8	60.5 ± 14.2	0.750
ICD (n, %)				
- No	92 (59.4%)	23 (59%)	69 (57%)	
- Yes	68 (40.6%)	16 (41.0%)	52 (43.0%)	0.830
ICD indication (n, %)				
- Primary prevention	60 (88.2%)	15 (93.8%)	45 (86.5%)	
- Secondary prevention	8 (11.8%)	1 (6.3%)	7 (13.5%)	0.670
Etiology (n, %)				
- Ischemic	73 (45.6%)	12 (30.8%)	61 (50.4%)	
- DCM	57 (35.6%)	21 (53.8%)	36 (29.8%)	
- Enolic	9 (5.6%)	1 (2.6%)	8 (6.6%)	
- Cardiac amyloidosis	7 (4.4%)	2 (5.1%)	5 (4.1%)	
- Valvular	8 (5.0%)	1 (2.6%)	7 (5.8%)	0.207
- Chagasic	2 (1.3%)	1 (2.6%)	1 (0.8%)	
- Restrictive	1 (0.6%)	0 (0%)	1 (0.8%)	
- Arrhythmogenic	1 (0.6%)	0 (0%)	1 (0.8%)	
- Arrhythmia induced	2 (1.3%)	1 (2.6%)	1 (0.8%)	

Basal characteristics